



**ADMINISTRATIVE
RECORD**

ENVIRONMENTAL PROTECTION AGENCY REGION 8

LIBBY ASBESTOS PROJECT

FINAL DISPOSAL OPERATIONS PLAN FOR THE FORMER W.R. GRACE MINE

May 2004



Prepared by:

**U.S. Department of Transportation
Research and Special Programs Administration**

**John A. Volpe National Transportation Systems Center
Environmental Engineering Division**

**55 Broadway, Kendall Square
Cambridge, Massachusetts 02142**

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Contents

Section 1	1-1
Section 2	2-1
2.1 Mine Site Description	2-1
2.2 Disposal Objectives	2-2
Section 3	3-1
3.1 Equipment Decontamination	3-1
3.2 Personnel Decontamination	3-1
Section 4	4-1
Section 5	5-1
Section 6	6-1
Section 7	7-1
7.1 General	7-1
7.2 Recordkeeping	7-1
7.3 Loading	7-2
7.4 Covering Loads	7-2
7.5 Dumping	7-2
7.6 Dust Suppression on Rainy Creek Road (Mine Road)	7-2
Section 8	8-1
8.1 Staffing	8-1
8.2 Water Supply	8-1
8.3 Disposal Site Procedures	8-1
Section 9	9-1

Appendices

Appendix A:

Figure 1:	Full Aerial View of Amphitheater
Figure 2:	Detailed Aerial View of Amphitheater
Figure 3:	Dumping at the Amphitheater by Local Trucks
Figure 4:	Alternate View of Amphitheater from 2 nd Haul Route
Figure 5:	Area 19 Disposal Site

Appendix B: Additional Information Links

Appendix C: Libby Asbestos Project Comprehensive Health and Safety Plan

Section 1 Introduction

The John A. Volpe National Transportation Systems Center (Volpe Center) is providing environmental engineering and remediation support to Region 8 of the Environmental Protection Agency (EPA). Volpe Center support includes the preparation of technical documents, development of environmental plans (e.g., sampling and analysis, removal action, etc.), environmental assessments and investigations, and removal and remediation projects. Currently the Volpe Center is supporting the EPA's Libby Asbestos Project. Investigative and cleanup actions are taking place under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund. The Volpe Center is providing support for the identification, removal and disposal of asbestos contaminated soil, vermiculite-containing insulation (VCI), and dust at numerous operable units and residential properties located in and around Libby, Montana. The insulation, dust and soil at these properties are contaminated with tremolite asbestos as a result of historic vermiculite mining in Libby, Montana by W.R. Grace.

Libby is the site of the former largest vermiculite mine in the world, which had been operational for 70 years. In the 1920s, the Zonolite Company formed and began mining vermiculite. In 1963, W.R. Grace bought the Zonolite mining operations. The mine closed in 1990. While in operation, the vermiculite mine in Libby may have produced 80 percent of the world's supply of vermiculite. Vermiculite has been used in building materials, as a soil conditioner, and as backfill material. It has been determined that the vermiculite from the Libby mine was contaminated with an exceedingly toxic form of naturally occurring asbestos called tremolite-actinolite asbestiform mineral fibers, herein referred to as Libby Amphibole (LA) asbestos.

Since late 1999, EPA, with assistance from the Volpe Center, has conducted comprehensive cleanup of properties throughout Libby, Montana. The purpose of this document is to outline operations at the former W.R. Grace mine (mine), which will serve as a disposal location for asbestos contaminated soil and material from numerous operable units and residences in Lincoln County, Montana as required by the EPA. Currently, asbestos contaminated soil is disposed at the mine, and VCI (along with asbestos contaminated material - ACM) is disposed of at the asbestos cell at the Lincoln County Class IV Asbestos Landfill (Asbestos Cell). This Former W.R. Grace Mine Disposal Operations Plan serves as a guidance document for current and future project mine operations, but may be amended at any time to reflect changes in operations and/or protocol.

Section 2

Former W.R. Grace Mine Disposal Operations Plan

2.1 Mine Site Description

The mine site is located approximately 6.6 miles up Rainy Creek Road (Mine Road) from Highway 37 in Libby, Montana. Historically, this site was the origin of raw vermiculite materials. All asbestos contaminated soils and some commingled contaminated materials that are associated with the EPA's response action in Libby, will be disposed of at the mine.

Contaminated soils will be hauled to the Mine Road and disposed of two miles along the paved road from Highway 37 at the former amphitheater area (amphitheater). A waste transfer station was constructed at the amphitheater previous to the 2003 construction season for overall project use. The mine road is paved from Highway 37 to the waste transfer station in order to allow trucks outfitted with positive pressure units to unload their waste and return to work sites in the Libby area while staying on an asphalt surface. The asphalt road serves as a "clean" surface for trucks to travel on and remain clean throughout the truck-hauling trip. A water truck will be utilized to maintain a clean asphalt surface during mine operations. The truck driver will dump the contents of the truck's bed and then proceed to clean the truck bed and rinse the truck tires before allowing the truck to leave the exclusion zone. The exclusion zone begins approximately 100 yards from the green gate, which is located at the beginning of the mine road, and continues the distance to the mine. The waste will then be transferred to trucks dedicated to the exclusion zone from the amphitheater staging area. These trucks will then haul the contaminated waste to the dumpsite (Area 19) at the mine where the placed soil and debris will then be spread. At the end of the work season, any equipment dedicated to the exclusion zone will require a complete decontamination.

The gravel roadway will be maintained from the amphitheater to Area 19 to allow access to the mine for disposal of soil and debris. Water trucks will be operated to provide proper dust control, and regular treatment of the roadway will be implemented to minimize the generation of dust from the road. Proper upkeep and maintenance of the road will occur periodically to prevent washouts and potholes from forming. Water will also be applied to minimize dust generation around the disposal operations.

A separate operable decon pad has been installed within the waste transfer station for vehicles previously authorized by the EPA, traveling between the exclusion zone and areas outside of the exclusion zone on a daily basis.

Figures 1 through 5 (Appendix A) are photographs with additional details imported onto them to further illustrate amphitheater and mine operations.

2.2 Disposal Objectives

The disposal of materials from various removal actions is planned for a one shift per day basis. Each shift will last ten hours, five days a week, Monday through Friday. The Mine Road will be in operation as long as weather permits safe operation. Amphitheater operations may be able to continue longer than actual mine dumping operations. If this is the case, contaminated soils and material will be stored at the amphitheater until operations to Area 19 of the mine start up the following spring.

This Mine Operations Plan describes the minimum activities necessary to transport asbestos-contaminated soil to designated disposal locations at the mine site. All transport and disposal work will be carried out in accordance with this Mine Operations Plan, the approved Project Comprehensive Health and Safety Plan (HASP), the approved operations HASP developed by the contractor responsible for mine operations, and all other government requirements. See Appendix C for the Comprehensive Site Health and Safety Program Plan, Initial Emergency Response Action, Libby Asbestos Project, Revision 3, May 2003.

Section 3 Decontamination

3.1 Equipment Decontamination

Thorough decontamination of the trucks will be required of any truck leaving the exclusion zone. The process will be to unlock tailgate locks, spray the truck box and rinse the truck tires with a pressure washer before allowing the truck to leave the exclusion zone. All means and methods will be used to insure all soil is removed from the truck box. The truck will then be visually inspected for remaining debris and tailgates re-locked upon satisfaction of the inspector, before the truck is allowed back in rotation to the removal sites. In addition to the daily decontaminations of the trucks at the amphitheater, at the end of the work season, any equipment dedicated to the exclusion zone will require complete decontamination.

During the summer of 2003, a second decontamination pad was installed adjacent to the amphitheater waste transfer station for use by W.R. Grace during the KDC Flyway Property clean-up operations. This second decontamination pad was installed as to not interfere with daily decontamination procedures being conducted. It is expected that W.R. Grace trucks will be hauling contaminated soil all the way to the mine and not using the waste transfer station at the amphitheater. After dumping the waste at the mine, the W.R. Grace trucks will return to the amphitheater area, decontaminate at the second decontamination pad, and then return to the Flyway property.

3.2 Personnel Decontamination

Proper decontamination facilities and rest room facilities on the border of the exclusion and clean zones will be established. Each decontamination facility will meet or exceed applicable Occupational Safety & Health Administration (OSHA) requirements, specifically those details pertaining to Safety and Health Regulations for Construction, Asbestos as outlined in 29 CFR Part 1926.1101. Each personnel decontamination facility will be provided with a first-aid station and full engineering controls including, but not limited to, employee personal protection equipment (PPE), fences, signs, traffic tape, etc. Sufficient water, heat, lighting, and electric power will be required at each personnel decontamination facility. All decontamination water will be collected and disposed of at the disposal location (Area 19) at the mine. All personnel that may come in contact with asbestos-containing material must use the decontamination facilities whenever leaving the exclusion zone and when their work shift is completed.

Section 4

Haul Routes

The Mine Road will be closed to all persons and vehicles not directly involved in the asbestos removal project. No public access will be permitted. Two-way radios will be used for communication. Beginning in the fall of 2003, Citizens Band (CB) radios will also be installed in each truck so that every driver has a reliable communication source during hauling operations. Coordination, loading, hauling, dumping, decontamination, and all related activities will be done in an efficient manner with a minimum of down time. Traffic control and speed limits must be established and adhered to in order to accommodate the truck volume, and to continue operating in a safe manner.

A second haul route has been established near the amphitheater so that W.R. Grace's Flyway Property clean-up operations will not interfere with current hauling conditions. The trucks will go around the waste transfer station on their way back from hauling to the mine disposal area and will be staged on the road until their designated decontamination pad is available for required decontamination processes.

Section 5 Health and Safety

All work during the operation of the mine will be conducted in Level C PPE. However, truck drivers fitted with positive pressure units in their cabs will not be required to wear Level C PPE. Only OSHA trained employees will be permitted past the green gate on the Mine Road. All work during mine operations will comply with the Comprehensive Site Health and Safety Plan (HASP). See Appendix C for the Comprehensive Site Health and Safety Program Plan, Initial Emergency Response Action, Libby Asbestos Project, Revision 3, May 2003. A site specific HASP for all work not included in the Comprehensive Site HASP will also be developed by any contractor involved with mine operations. Minimum required elements of the site specific HASP are as follows:

- Delineation of work zones including exclusion zone, contamination reduction zone, and support zone;
- Description of site hazards and contaminants (asbestos);
- Identification of Site Health and Safety Coordinator;
- Description of Level C PPE, to include the use of air purifying respirators with P100 cartridges in the exclusion zone, and powered air purifying respirators (PAPRs) for the dozer operator stationed at Area 19;
- Any site field monitoring to be performed;
- Personnel and equipment decontamination procedures;
- Emergency contact names and phone numbers; and
- Signature page signed by all site personnel indicating that the HASP is understood and will be complied with.

Personal air monitoring will be performed by the government's air monitoring subcontractor. Personal air monitoring will be conducted at a frequency based on the results of an assessment in accordance with OSHA regulations.

Section 6 Air Monitoring

The government will be responsible for planning, coordinating, and conducting air monitoring during all transport and disposal activities. The government's air monitoring subcontractor will provide all labor, equipment, materials, and incidentals required to perform all perimeter and personal air monitoring throughout the transport and disposal work at all locations identified in this operations plan. All air monitoring functions will meet the applicable OSHA regulations and all government requirements.

In addition to ambient air sampling, personal air sampling will be conducted on all workers and truck drivers to document compliance with 29 CFR Part 1926.1101. All personal air samples will be collected and analyzed in accordance with 29 CFR 1926.1101. Additional air sampling protocol is addressed in the Final Draft Response Action Work Plan (RAWP), Libby Asbestos Project, Libby, Montana, November 2003. The RAWP once finalized will serve as the final reference document.

Section 7 Transportation Activities

7.1 General

All truck drivers and personnel that may come in contact with asbestos-containing materials, must be 40-hour Hazardous Waste Operations (HAZWOPER) OSHA trained as described in the Comprehensive HASP. All personnel working on transport and disposal activities will be required to provide proper documentation confirming their 40-hour OSHA training certification is complete and refresher training is up to date. All trucks must be outfitted with positive pressure units in the cab area for truck driver safety.

Successful mine operation will include responsibility for planning, coordinating, controlling, and performing all transportation activities associated directly with mine operations. This includes, but is not limited to, determining and subcontracting the number of trucks and drivers needed for hauling materials from the amphitheater to Area 19, equipment and operators for loading trucks, covering all loads, equipment and personnel decontamination, dust suppression, disposal operations, Mine Road maintenance, traffic controls including signage, and all related work. Disposal activities are to be performed in a safe manner while adhering to the requirements of this mine operations plan and the Comprehensive HASP. Truck and driver numbers may be adjusted as necessary pertaining to the transport and disposal activities, as to minimize down time.

All transport operations will be conducted in compliance with all U.S. Department of Transportation (DOT) requirements, all Montana DOT requirements, applicable Montana Department of Environmental Quality (DEQ) Administrative Rules of Montana (ARM) requirements, including but not limited to load limits and necessary permits and registrations.

7.2 Recordkeeping

Trucks transporting materials to the amphitheater and to the mine will not be weighed for purposes of determining quantities of contaminated soil and other materials being disposed at the mine. However, trucks traveling to the mine (amphitheater and Area 19) will be counted and documented in a daily log of disposal activities. Bills of lading for the waste will be maintained and a copy furnished to the on-site government representative at the end of each season. Recordkeeping will follow the rules outlined in the Montana DEQ's ARM.

7.3 Loading

All trucks will be loaded in a manner that does not produce visible dust and that is in compliance with all air monitoring levels established by the government for this project. Truckloads will be limited to an amount that allows complete covering of the load and spillage on bumpy road does not occur. It is required that water misting be employed to control dust emissions during actual truck loading operations, along the paved portion of the road to the amphitheater, from the amphitheater to the disposal location at Area 19, and periodically by water truck during travel from loading areas to the amphitheater.

7.4 Covering Loads

All loaded trucks will be covered in a manner such that no visible or detectable dust emissions are generated during transport along Highway 37, the Mine Road or any other roadways traveled during the execution of the project. All loaded trucks traveling on public or private roads, will be tightly covered with a weather tight canvas roll roof or other durable and tear-proof material in a manner such that emissions are not visible or detectable from the trucks at any time during the trip to the disposal locations at the amphitheater dumping location. Truck covers will extend a minimum of one foot below the top of the truck body and be secured to the truck body with elastic tie down straps. Damaged or torn truck covers will immediately be replaced. Each truck cover will be checked for condition and fit on the truck prior to the truck leaving a removal site and the amphitheater. It will be recommended that trucks leaving the disposal site at Area 19 on their return haul to the amphitheater be covered as described above for the amphitheater to removal site trips, and will be required to do so if air monitoring activities determine this method ineffective.

7.5 Dumping

Coordination of the disposal activities will be implemented at the designated disposal areas at the amphitheater staging area and the actual mine dump site. Dumping contents of trucks will be performed in a manner such that there are no visible or detectable dust emissions. Areas where disposal takes place will be sprayed with water to prevent dust emissions. Areas with dust emissions will be sprayed with water until dust levels drop to acceptable levels as required by the government and do not endanger or impede the performance of personnel working in the area.

7.6 Dust Suppression on Rainy Creek Road (Mine Road)

Dust suppression is a primary concern with respect to transport and disposal activities on this project. The lower 2 miles of Rainy Creek Road is paved asphalt. Trucks and other equipment leaving the exclusion zone will be decontaminated at the amphitheater decontamination facility and proceed onto the paved portion of Rainy Creek Road to Highway 37. The primary method of dust control will be water utilization. There will be designated trucks moving contaminated soils and materials from the waste transfer

station at the amphitheater to the mine disposal site, thus these trucks never leave the exclusion zone. An adequate water supply and a sufficient number of water trucks and drivers to keep the Mine Road free from visible and detectable dust emissions will be required at all times when transport activities are underway. Water truck drivers will be required to meet the same OSHA health and safety requirements as drivers of trucks hauling asbestos contaminated soils and other materials. Dust suppression measures will be conducted in compliance with the requirements established by the Montana DOT, the government, and in the approved HASP.

Section 8 Disposal Site Management

8.1 Staffing

Coordination and planning of disposal activities at the mine site with respect to transport activities will be implemented. Staff will be equipped with two-way communication in the trucks so that traffic runs smoothly and efficiently throughout the entire operation. Representatives will be at the disposal locations to direct trucks to the appropriate disposal site. A sufficient number of workers will be employed to provide adequate water for dust suppression at the amphitheater and at Area 19, and for directing truck traffic and other subcontractors throughout the operation.

8.2 Water Supply

Adequate water supply will be essential at Area 19, along the Mine Road, at the amphitheater and at the personnel decontamination facility on Rainy Creek Road. There will be access to a settling pond located adjacent to the amphitheater in which the water is filtered for LA by 20 and 5 micron filters and then pumped for use in dust suppression and decontamination procedures.

8.3 Disposal Site Procedures

Traffic flow will be coordinated at the disposal locations. Traffic flow includes the loading, transport, disposal, and departure of empty trucks so that each category of material is disposed at the disposal location designated by EPA to receive that particular waste. Personnel will direct each truck to the proper disposal location, direct the physical dumping of each truck load, provide acceptable dust suppression, conduct decontamination procedures, and provide the front end loader, bulldozer and all other mechanical equipment necessary to effectively operate the complete mine operations.

Daily cover will not be placed at the disposal sites. A final design for mine stabilization once the project is complete, has not yet been finalized.

Section 9

Site Security

Security will be present at the entrance of the Mine Road before the green gate during normal remedial operations hours. Normal operations hours consist of a 50-hour workweek, Monday through Friday, 7:00 a.m. to 6:30 p.m. The mine operations schedule will be contingent on proper weather and road conditions.

Appendix A



Figure 1: Full Aerial View of Amphitheater

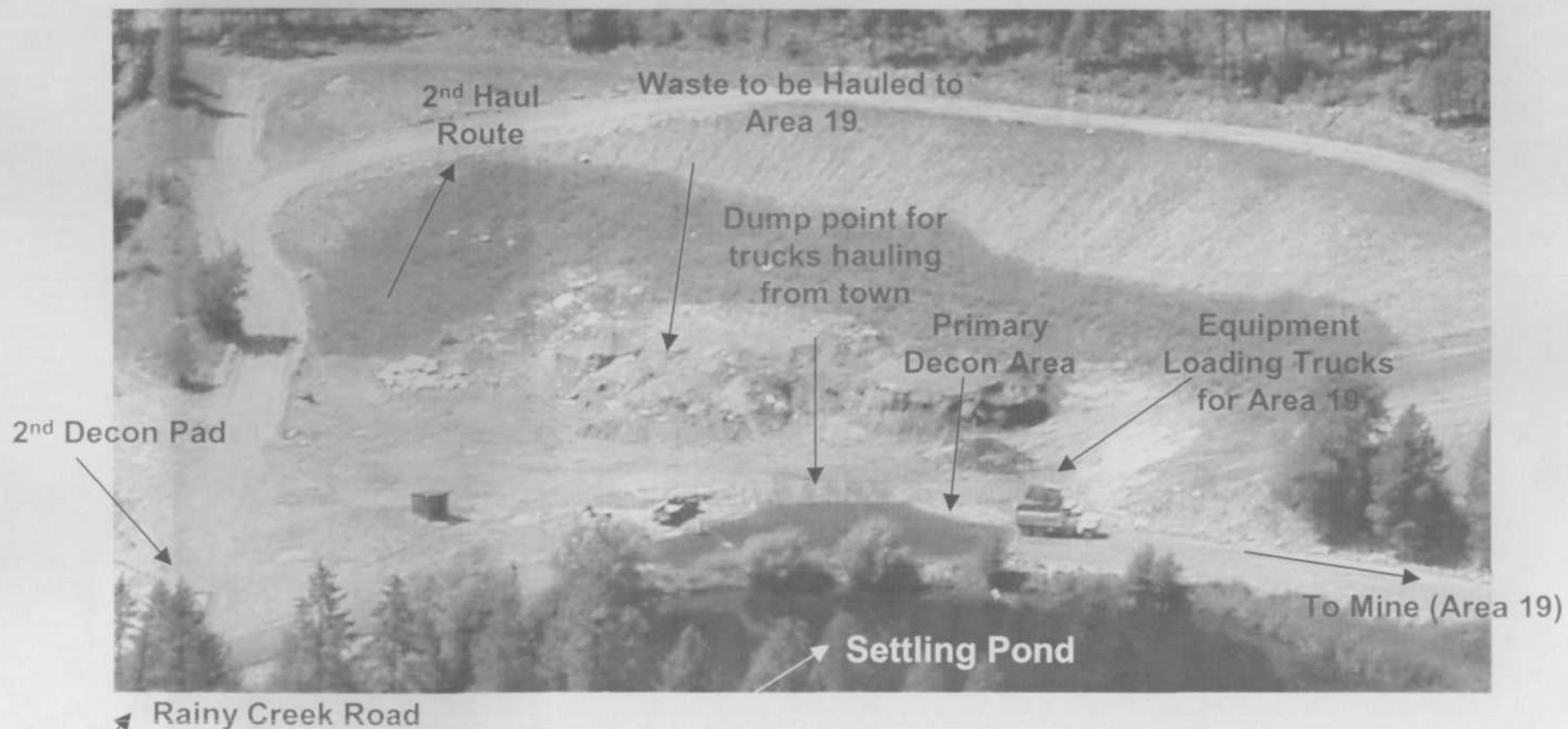
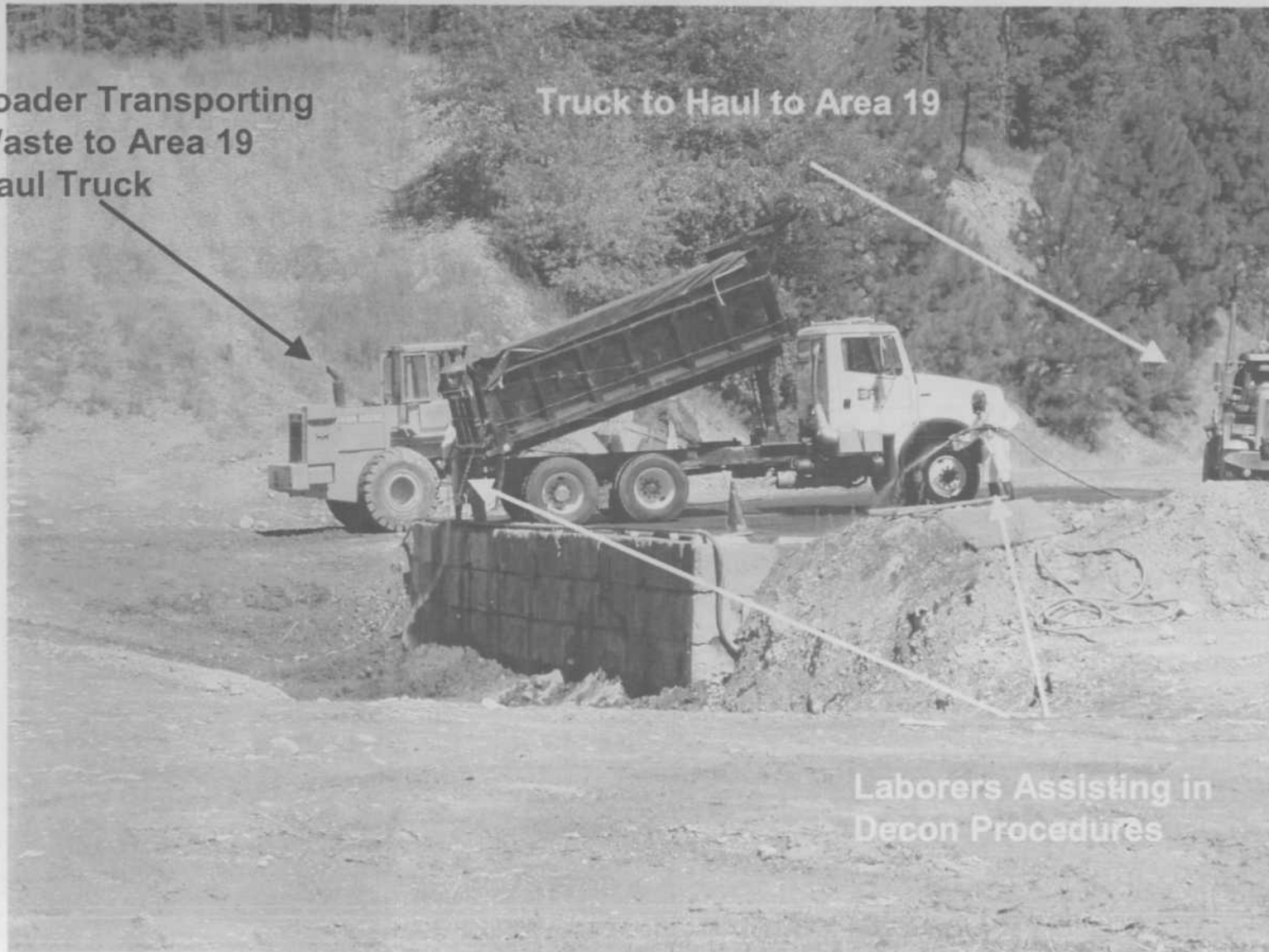


Figure 2: Detailed Aerial View of Amphitheater

Loader Transporting
Waste to Area 19
Haul Truck

Truck to Haul to Area 19



Laborers Assisting in
Decon Procedures

Figure 3: Dumping at the Amphitheater by Local Trucks



Figure 4: Alternate View of Amphitheater from 2nd Haul Route



**Figure 5: Area 19
Disposal Site**



Appendix B

Appendix B

Additional Information Links

- U.S. Environmental Protection Agency (EPA) – Region 8
<http://www.epa.gov/region8/superfund/libby/>
- U.S. Department of Transportation (DOT), John A. Volpe National Transportation Systems Center. - <http://www.volpe.dot.gov>
- U.S. Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1926.1101 -
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STAN DARDS&p_id=10862
- Montana Department of Transportation (MDOT) –
<http://www.mdt.state.mt.us/>
- Montana Department of Environmental Quality (DEQ), Administrative Rules of Montana (ARM) - <http://www.deq.state.mt.us/dir/legal/title17.asp>

Appendix C

Comprehensive Site Health and Safety Program

Initial Emergency Response Action Libby Asbestos Project

Contract No. DTRS57-99-D-00017
Task Order No. C0013

Prepared for:

U. S. Department of Transportation
Research and Special Programs Administration

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Revision 3

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0	April 2001	–
1	May 2001	Organizational clarifications
2	May 2002	Organizational clarifications
3	May 2003	Organizational clarifications

Contents

Acknowledgement and Signature Page

1.0	INTRODUCTION	
1.1	Purpose of Comprehensive Site Health and Safety Program	1-1
1.2	Responsibilities of Comprehensive Health and Safety Program	1-1
1.3	Revision of the Comprehensive Health and Safety Program	1-2
1.4	Implementation of the Comprehensive Health and Safety Program	1-2
2.0	PROJECT BACKGROUND	
2.1	Vermiculite Mining Near Libby	2-1
2.2	Environmental Setting	2-2
2.3	Contaminant of Concern	2-3
3.0	HEALTH AND SAFETY PROJECT ORGANIZATION	
3.1	Organization and Safety Responsibilities	3-1
3.2	Responsible Persons	3-1
3.2.1	Project Managers	3-1
3.2.2	Certified Industrial Hygienist	3-2
3.2.3	Site Health and Safety Officer	3-2
3.2.4	Site Supervisors	3-3
3.2.5	Field Personnel	3-3
3.2.6	Subcontractors	3-4
3.2.7	Authorized Site Visitors	3-4
4.0	HAZARD ASSESSMENT	4-1
5.0	GENERAL HEALTH AND SAFETY PROGRAM	
5.1	Project Management	5-1
5.1.1	Planning	5-1
5.1.2	Effective Project Coordination	5-2
5.1.3	Management Emphasis on Safety	5-2
5.1.4	Communication	5-2
5.1.5	Safe Work Environment	5-3
5.1.6	Safety Audits/Inspections	5-3
5.1.7	Correcting Unsafe Conditions	5-3
5.2	Standard Site Procedures	5-3
5.2.1	Housekeeping	5-4
5.2.2	Personal Protective Equipment	5-4
5.2.3	Fall Protection	5-5
5.2.4	Welding and Cutting	5-6
5.2.5	Rigging Equipment	5-8
5.2.6	Excavation	5-9
5.2.7	Ladders	5-9
5.2.8	Material Handling	5-11
5.2.9	Hand Tools	5-12
5.2.10	Portable Electric Tools	5-13
5.2.11	Pneumatic Tools	5-13
5.2.12	Cranes, Derricks, Hoisting Equipment	5-14
5.2.13	Flammable and Combustible Liquids	5-15
5.3	Accident Reporting and Investigation	5-16
5.3.1	Follow Up	5-16

6.0	TRAINING		
6.1	Introduction		6-1
6.2	Initial Training		6-1
6.3	Refresher Training		6-1
6.4	Supervisory Training		6-2
6.5	Site Orientation		6-2
6.6	Toolbox Safety Meetings		6-2
6.7	Subcontractor Training		6-3
6.8	Record Keeping		6-3
6.9	Hazard Communication		6-3
	6.9.1	Material Safety Data Sheets	6-4
	6.9.2	Labels	6-4
	6.9.3	Nonroutine Tasks	6-4
	6.9.4	Education and Training	6-5
	6.9.5	Informing Other Employees	6-5
7.0	MEDICAL SURVEILLANCE		
7.1	Baseline Medical Examination		7-2
7.2	Annual/Interim Medical Examinations		7-2
7.3	Exit Medical Examination		7-3
7.4	Return-to-Work Examinations		7-3
7.5	Access to Employee Records		7-3
8.0	PERSONAL PROTECTIVE EQUIPMENT		
8.1	Levels of Protection		8-1
8.2	Use of Personal Protective Equipment		8-4
	8.2.1	Hard Hats	8-4
	8.2.2	Safety Glasses	8-4
	8.2.3	Respirators	8-5
	8.2.4	Hearing Protection	8-5
9.0	RESPIRATORY PROTECTION		
9.1	Definitions		9-1
9.2	General Requirements		9-2
9.3	Medical Surveillance		9-2
9.4	Selection of Respiratory Protective Devices		9-3
9.5	Training		9-5
9.6	Fit Testing and Field Checks		9-6
9.7	Inspection		9-6
9.8	Use, Maintenance, and Care		9-6
9.9	Breathing Air		9-7
10.0	SITE SPECIFIC HEALTH AND SAFETY PLANS		
10.1	HASP Elements		10-1
10.2	Standard HASP Form		10-2
11.0	TEMPERATURE EXTREMES		
11.1	Introduction		11-1
11.2	Heat Stress		11-1
	11.2.1	Prevention Measures	11-2
	11.2.2	Heat Stress Monitoring	11-3
11.3	Cold Stress		11-3
	11.3.1	Preventive Measures	11-4
	11.3.2	Cold Stress Monitoring	11-4

Appendices

Appendix A Forms

- Form A - Injury/Illness Report Form
- Form B - Employee Meeting Record
- Form C - Site-Specific Training Record
- Form D - Hot Work Permit
- Form E - Trench/Excavation Permit
- Form F - Confined Space Entry Permit
- Form G - Task-Specific Health and Safety Plan
- Form H - Medical Authorization Form
- Form I - Request for Medical Records
- Form J - Respirator Training Documentation Form
- Form K - Jobsite Safety Audit
- Form L - Activity Hazard Analysis

Appendix B - Activity Specific Health and Safety Plans

Appendix C - Health and Safety Protocol for Subcontractors

Appendix D - Health and Safety Audit Criteria

Tables

7-1	Medical Monitoring Protocol	7-1
8-1	Levels of Protection	8-2
9-1	Respiratory Protection Factors	9-4
11-1	Windchill Index	11-5

Abbreviations and Acronyms

AHERA	Asbestos Hazard Emergency Response Act
ASTM	American Society for Testing and Materials
CDM Federal	CDM Federal Programs Corporation
CFR	Code of Federal Regulations
cm ²	square centimeter
COTR	Contracting Officer Technical Representative
CSHASP	Comprehensive Site Health and Safety Plan
EMSL	EMSL Analytical Inc.
EPA	U. S. Environmental Protection Agency
ERT	EPA Emergency Response Team
f/cc	fibers per cubic centimeter
GLP	good laboratory practices
GPS	global positioning system
ISSI	ISSI Consulting Group, Inc.
ISO	International Standards Organization
kV	kilovolt
L	liter
MFL	million fibers per liter
MSDS	Material Safety Data Sheet
nm	nanometer
NIOSH	National Institute of Occupational Safety and Health
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PCM	phase contrast microscopy
PES	Pacific Environmental Services, Inc.
PLM	Polarized Light Microscopy
QC	quality control
S/mm ²	structures per square millimeter
SHSO	Site Health and Safety Officer
SOP	Standard Operating Procedure
SQAPP	Sampling and Quality Assurance Project Plan
TEM	transmission electron microscopy
TLV	threshold limit value
Volpe Center	John A. Volpe National Transportation Systems Center
°C	degrees Celsius
°F	degrees Fahrenheit

Section 1

Introduction

This Comprehensive Site Health and Safety Program (CSHASP) was prepared by CDM Federal Programs Corporation (CDM Federal) for the John A. Volpe National Transportation Systems Center (Volpe Center) of the U. S. Department of Transportation, Contract No. DTRS57-99-D-00017, Libby Asbestos Project, Libby, Montana. This CSHASP is submitted in accordance with Section 2.2, "Comprehensive Health and Safety Plan," of Task Order No. C0013, Technical Direction No. 7. This plan is based on all available site-specific data. In addition to other regulatory requirements, all work will be performed in compliance with regulations set forth by the U. S. Occupational Safety and Health Administration's (OSHA) Title 29 of the Code of Federal Regulations (CFR), Parts 1910 and 1926; and EPA's Hazardous Waste Requirements (40 CFR 260-270). The contents of this CSHASP are subject to review and revisions as new information becomes available.

1.1 Purpose of the Comprehensive Site Health and Safety Program

The purpose of this CSHASP is to describe the chemical and safety hazards that may be present, and the precautions to be taken to abate these hazards during site investigation, which includes the collection of various types of environmental samples, and removal activities at the Libby site. The safety and health procedures outlined in this CSHASP are designed to minimize the possibility of injury or chemical exposure to site personnel during various sampling and removal activities.

This CSHASP is intended as a guideline that allows the Site Health and Safety Officer (SHSO) to respond to changing conditions regarding the interpretation of monitoring data and related control measures.

1.2 Responsibilities of the Comprehensive Health and Safety Program

The requirements established by this CSHASP are mandatory, and apply to all Volpe Center personnel and Volpe Center subcontractors involved in implementing the described scope of work, and any other personnel entering regulated work areas during active field operations. The Volpe Center is responsible for training all of its employees and subcontractors regarding the information and contents of the CSHASP prior to the commencement of work. This document is to be read and understood by all site personnel and visitors. The Volpe Center will provide a copy of this plan to any authorized personnel who must enter regulated work areas. Such personnel are required to sign the CSHASP as an acknowledgment of agreement, acceptance, and understanding of the contents (Appendix A). The Volpe Center will maintain a copy of the CSHASP, available for inspection, at the work site during each day of field operations.

The SHSO will be responsible for implementing this plan and will report directly to the Project Manager on all project related health and safety matters. In the event that an emergency situation arises, the SHSO will coordinate with the on-site Volpe Center Project Manager, the EPA On-Scene Coordinator (OSC), and contractor Field Team Leaders, as needed. The SHSO has the authority to intercede directly and stop any unsafe practices.

1.3 Revision of the Comprehensive Health and Safety Program

Changes in the scope of work operations, and/or changing or unanticipated site conditions may require modification and approval of the CSHASP in order to maintain field safety in compliance with contract requirements and OSHA regulations. Work operations affected by the revisions will not proceed unless specifically authorized by the Contracting Officer Technical Representative (COTR). Only the COTR may authorize operations to continue while changes to the CSHASP are under review by the contracting agency.

1.4 Implementation of the Comprehensive Health and Safety Program

Before activities begin on or around the site, a health and safety planning or "tailgate" meeting will be held with site personnel to discuss safety procedures and to familiarize personnel with the potential hazards of the site. Site personnel will be informed of any modifications to the CSHASP during the daily tailgate safety meetings or when site conditions or risks change.

The SHSO will perform daily safety inspections throughout the project to evaluate site operations. In addition, the SHSO will conduct a daily tailgate safety meeting with all site personnel.

Section 2

Project Background

2.1 Vermiculite Mining Near Libby

The town of Libby is located in the extreme northwest corner of Montana. According to historical mining records, up to 80 percent of the world's vermiculite has come from the W.R. Grace Vermiculite Mine located on Zonolite Mountain approximately seven miles northeast of Libby. Vermiculite is a mineral that is used in various building materials and textiles. Disseminated within the enormous deposit of vermiculite on Zonolite Mountain is the mineral tremolite, which is known as a rare and exceedingly toxic form of asbestos. Over the roughly 60-year life of the mine, tremolite asbestos was released into the environment and potentially in the town of Libby as a by-product of the mining and ore-processing activities.

The W.R. Grace Vermiculite Mine began operation in 1924 by owner Edward Alley. In 1925, Great Northern Railroad shipped the first boxcar of "Zonolite" from Libby to an Ohio company that used it to insulate bank vaults, office safes, and filing cabinets. Other firms used the material to make building boards and roofing materials. Processing the material was a straightforward process. The vermiculite ore was stripped from the mine and hauled in trucks to a mill, where it was separated into various commercial sizes through a screening system. Some of the ore was shipped untouched. Other material was sent to an expansion plant where it was run through ovens at about 2,000 degrees Fahrenheit (°F), causing it to expand to 15 times its original size. In 1939, Alley's mine merged with another company mining at the bottom of the hill that eventually became known as the Zonolite Company.

In 1963, the company was sold to W.R. Grace and Company (W.R. Grace), who expanded the operation and increased vermiculite production. Through the '60s, '70s, and '80s, millions of tons of Libby vermiculite ore was shipped by rail from W.R. Grace plants and other companies in 30 states and six foreign countries. At one time, 80 percent of the world's vermiculite came from Libby.

The former Screening Plant area, designated by EPA as OU02, was utilized by W.R. Grace to sort mined vermiculite by grade. The Screening Plant Area, also referred to as the "Railroad Loading Station" or "Raintree Nursery" in previous investigations, is approximately 21 acres (according to county records). Located on the northeast side of the Kootenai River, the site is approximately 4.5 miles northeast of Libby. A site location map is presented as Figure 1-1.

The vermiculite was transported to the Screening Plant by truck from the mine, located several miles up nearby Rainy Creek Road, and sorted and stored in two sheds at the facility. The vermiculite was then loaded onto a conveyor system and transported across the Kootenai River to the southeast bank for loading onto railroad cars for transportation and distribution to various expansion plants, including the

Export Plant in Libby, designated by EPA as OU01. The site was most recently operated as a plant nursery, selling nursery-related products and storage for nursery and related supplies, as well as providing leased storage space for recreational vehicles, boats, automobiles, and other items.

It is estimated that tons of asbestos were released into the air during more than six decades of vermiculite mining at the W.R. Grace Vermiculite Mine, six miles east of Libby. W.R. Grace, which owned the mine for 30 years, closed the mine in 1990 and sold its properties four years later. In July 2000, W.R. Grace reacquired the mine site and some other associated properties, however, the former Screening Plant remains under ownership by another party.

Piles of vermiculite waste materials remain near the mine and processing facilities in and around Libby. Vermiculite materials were also used by local citizens as general fill, covers on ballparks, gardens, and home insulation. This toxic asbestos associated with the vermiculite material has known detrimental affects on former workers at the various facilities and may potentially be affecting the health of the residents of Libby. Due to this potential threat to human health, the EPA requested emergency environmental response support from the Volpe Center.

2.2 Environmental Setting

Mean annual precipitation in Libby is 19.4 inches, with 37 percent of it occurring in the months of November through January, and 18 percent falling in the months of May and June. The month having the highest average precipitation is January, with 2.42 inches. Average ambient temperature in Libby ranges from 22.4°F in January to 67°F in July. Average annual precipitation at the W.R. Grace mine site is estimated at 20 inches per year (USDA, 1977), and the temperature would be expected to average 3 to 5 degrees cooler than at Libby. Climatological data was obtained from the Libby 1 N.E. Ranger station.

Soils for both the Rainy Creek and Fleetwood Drainage Basins in the area have been assigned a Hydrologic Soil Classification of "B" and a runoff "Curve Number" of 60 by the Soil Conservation Service. The drainage basin in the vicinity of the mine site is estimated to have >75% ground cover of mature forest in good condition, with moderate slopes. Antecedent moisture is considered to be average.

The geology of the site consists of the late Precambrian Belt Group consisting of fine-grained clastic and carbonate rocks that have undergone various degrees of metamorphism, and are covered with glacial outwash and till. The tailings impoundment is located on an intrusive rock body called the Rainy Creek stock, of which Vermiculite Mountain and W.R. Grace's mining area is a part. Depths to bedrock range from less than 2 feet to about 25 feet on the valley walls and from 20 to 45 feet on the valley floor.

Vegetation in the region consists of grasses, coniferous shrubs, and of a mixture of deciduous (primarily cottonwood, alder, and aspen) and coniferous trees (cedar,

larch, Douglas fir, ponderosa and lodgepole pine, and spruce). Active logging is taking place within the drainage basin of the mine site, both on the mine property and on adjacent Forest Service land.

2.3 Contaminant of Concern

The contaminant of concern for this project is asbestos. Asbestos is a generic term for a group of six naturally occurring, fibrous silicate minerals that have been widely used in commercial products. Asbestos minerals fall into two groups of classes: serpentine asbestos and amphibole asbestos. Serpentine asbestos, which includes the mineral chrysotile, a magnesium silicate mineral, possesses relatively long and flexible crystalline fibers that are capable of being woven. Amphibole asbestos, which includes the minerals amosite, crocidolite, tremolite, anthophyllite, and actinolite, form crystalline fibers that are substantially more brittle than serpentine asbestos.

Asbestos is of potential health concern because chronic inhalation exposure to excessive levels of asbestos fibers suspended in air can result in lung disease such as asbestosis (a non-cancer effect) and lung cancer and mesothelioma (cancer effects).

Section 3

Health and Safety Project Organization

3.1 Organization and Safety Responsibilities

Based on the scope of work, the Volpe Center field work team will consist of the Project Manager (PM), Site Health and Safety Officer (SHSO), and contractor Field Team Leaders, sampling personnel, and equipment operators. This section presents discussions of the health and safety responsibilities of Volpe Center personnel and their subcontractors, and authorized site visitors.

The Volpe Center has a definite line of reporting for individuals tasked with health and safety responsibilities. The health and safety responsibilities of the project team are outlined in the following sections.

3.2 Responsible Persons

3.2.1 Project Managers

The health and safety responsibilities of on-site Project Managers include, but are not limited to:

- # Ensuring that the CSHASP is approved by the contracting agency prior to commencement of operations
- # Ensuring that all personnel assigned to the project are instructed on the work plan, operations to be performed, known and potential hazards associated with the work, CSHASP requirements, proper use of required personal protective equipment, specified safe work practice, proper action in the event of a medical or chemical emergencies, and related site specific safety information
- # Ensuring that all field personnel, including any subcontractor personnel, assigned to the project satisfy all requirements for training and medical surveillance as specified by 29 CFR 1910.120, and that records of training and medical approval are available and maintained for each person
- # Ensuring that required personal protective equipment, air monitoring instruments, and other safety-related items are provided for the project
- # Monitoring overall safety performance of field personnel, in coordination with the SHSO and the Site Supervisor
- # Correcting any work practices and/or conditions that may result in injury and/or exposure to hazards
- # Immediately stopping Volpe Center (including subcontractor) operations in the event of an emergency or serious hazard

- # Preparing and submitting required work progress/accident history reports and air monitoring reports
- # Maintaining all required safety and health records (i.e. OSHA 200 Logs, Accident Reports, Records of Training, Safety Inspection Reports, etc.).

3.2.2 Health and Safety Manager

The health and safety responsibilities of the Health and Safety Manager (HSM) include, but are not limited to:

- # Providing oversight and enforcing the CSHASP
- # Signing and dating the CSHASP prior to submittal
- # Evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE
- # Coordinating with SHSO for any on-site training
- # Providing 24-hour availability for consultation with SHSO during on-site emergencies
- # Providing on-site consultation, as needed
- # Coordinating any modifications to the CSHASP with the PM, the Site Superintendent, the SHSO, and the COTR
- # Providing continued support for upgrading/downgrading of the level of personal protection

3.2.3 Site Health and Safety Officer

The health and safety responsibilities of the SHSO include, but are not limited to:

- # Supervising daily on-site implementation and enforcement of the CSHASP
- # Being on-site for the duration of field activities for safety- and health-related duties
- # Ensuring site compliance with federal, state and OSHA safety and health regulations and all requirements of the CSHASP including, but not limited to, activity hazard analyses, air monitoring, use of PPE, decontamination, site control, procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, spill containment program, and documentation of the daily safety and health inspection results
- # Conducting all necessary on-site training
- # Stopping work if unacceptable health or safety conditions exist, and taking necessary action to re-establish and maintain safe working conditions
- # Consulting with and coordinate any modifications to the CSHASP with the EPA OSC, the HSM, PMs, the Site Superintendent, and the COTR

- # Serving as a member of the quality control staff on matters relating to safety and health
- # Conducting accident investigations and preparing accident reports
- # Documenting the safety and health findings during daily quality control inspections
- # Recommending corrective actions for identified safety and health deficiencies and overseeing the corrective actions, in coordination with site management
- # The SHSO will perform collateral duties as the Site Quality Control Officer (QCO) on this project with the combined title of Site Health and Safety/Quality Control Officer (SSH/QCO).
- # The health and safety responsibilities of the QCO include, but are not limited to:
- # Assuring that all personnel on-site are acquainted with the provisions of CSHASP, particularly the toxicologic properties of present or suspected material
- # Inspecting safety and health equipment to assure proper operation and accuracy
- # Monitoring the PPE and safety practices of the QC staff

3.2.4 Site Supervisors

The health and safety responsibilities include, but are not limited to:

- # Ensuring that site personnel have read, signed, and will implement the CSHASP
- # Correcting any work practices and/or conditions that may result in injury and/or exposure to hazards
- # Coordinating with the SHSO on accident investigations. Appendix A contains the Incident/Accident Reporting Form

3.2.5 Field Personnel

The health and safety responsibilities of field personnel include, but are not limited to:

- # Following the guidelines, rules, and procedures set forth in this document
- # Acting in a responsible and cautious manner in order to prevent accident, injury and/or exposure to themselves and their co-workers
- # Reporting recognized unsafe conditions and actions to the SHSO and/or the Site Supervisor
- # Reporting any and all accidents, injuries, exposures and/or near misses to the SHSO and/or the Field Supervisor

- # Attending and participating in daily tailgate safety meetings conducted during the project
- # Following the instructions and directions of the SHSO and the Project Manager
- # Utilizing the PPE provided and specified
- # Following all field safety procedures for safe work practices, buddy system, communication, site control, decontamination, evacuations, and related emergency procedures
- # Performing only those tasks they are instructed to perform and they are trained, qualified, and capable of performing
- # Reporting to the Project Manager or SHSO any condition they believe could affect their safety and/or the safety of co-workers
- # Ensuring that no work tasks are performed in deviation from the CSHASP and/or the initial instructions of the Site Supervisor or Site Health and Safety Officer without the expressed authorization and additional instruction from the Site Supervisor and/or SHSO

3.2.6 Subcontractors

The health and safety responsibilities are defined in Appendix C, CDM Federal Health and Safety Protocol for Subcontractors, and include the following:

- # Subcontractors have the same responsibilities as Volpe Center field personnel (Section 3.1.6)
- # Provide Material Safety Data Sheets (MSDSs) for subcontractor-provided materials at the job site

3.2.7 Authorized Site Visitors

The health and safety responsibilities include:

- # Receiving site hazard and safety instructions from the SHSO
- # Reviewing and complying with the CSHASP
- # Using PPE to enter regulated work areas, when such controls are required for entry as per the CSHASP
- # Reporting any observed unsafe act and/or condition at, or affecting, the work site

In addition, any official visitor who seeks entry into work area will present documentation of health and safety training in compliance with OSHA 29 CFR 19.10.120, Medical Surveillance Examination and Certification, and Respirator Fit Testing. In addition, a visitor log will be maintained in the project trailer.

Section 4

Hazard Assessment

Tremolite-actinolite asbestos is known to be present at the site. Hazards associated with breathing airborne asbestos fibers are well documented. Hazards include asbestosis, a disease that makes breathing progressively more difficult due to scarring of the lung tissue and can be fatal. Asbestos fibers also cause lung cancer and mesothelioma. Mesothelioma is a rare cancer of the lining of the lungs and chest cavity that is always fatal and can almost always be associated with asbestos exposures. Asbestos has also been associated with increases in digestive cancers from accidental ingestion.

The primary concern is breathing airborne asbestos fibers. All site personnel will be protected from asbestos exposure through work practices. These work practices include wetting the soil during excavation, covering trucks during hauling, and considering wind direction during work activities. Personal protective equipment will be used by site personnel. Personal protective equipment will include the use of NIOSH-approved respirators with high-efficiency cartridges and Tyvek disposable clothing. All site personnel will complete personal decontamination on a daily basis.

The project includes excavation and transport of large volumes of soil. Additionally, building demolition and debris removal will be completed. Safety hazards associated with general construction activities - slips, trips, falls, pinch points, collisions - present a more consistent and potentially greater risk than asbestos exposure.

Section 5

General Health and Safety Program

5.1 Project Management

The most influential factor controlling project safety is effective project management, and the most influential personnel in this regard are the project managers. Listed below in descending order are the five most important tools that project managers have to influence project safety:

- # Effective project management
- # Job coordination
- # Management emphasis on safety
- # Communication
- # Safe work environment

Projects that run smoothly and are planned properly will show good safety performances. The opposite also holds true: jobs that run poorly (i.e., jobs behind schedule, under staffed, or poorly equipped) will ultimately show poor safety performances.

***Incorporating safety into initial project planning
enables site workers to perform tasks safely with
adequate staff, time, and equipment.***

5.1.1 Planning

Safety must be incorporated into the project from start to finish to maintain good safety performance. Incorporating safety into initial project planning enables site workers to perform tasks safely with adequate staff, time, and equipment. Up-front planning also allows for comprehensive hazard recognition and control planning by qualified staff. Activities such as confined space entry, emergency response, and site safety meetings must be recognized and coordinated early in the project planning stages.

When planning for safety, project managers should consider the following:

Costs. Costs should be considered for safety equipment such as decontamination trailers, air monitoring instruments, rescue equipment, protective clothing, and respirators.

Staff. Project managers should plan for adequate, qualified staff to perform the job safely. Staffing considerations include rescue personnel, partners for the buddy system, and staff to perform air monitoring and prepare the health and safety plan (HASP).

Time. Time should be allotted for necessary safety activities, including site safety inspections, weekly Toolbox Safety Meetings, and site-specific health and safety plans (SHASPs) and/or Activity Hazard Analyses (AHAs) preparation and review.

5.1.2 Effective Project Coordination

Safety performance improves with improved project coordination. The following areas, when effectively coordinated by project managers, benefit project safety performance:

- # Coordinating subcontractor activities
- # Coordinating staff and crew size
- # Coordinating with local hospital, rescue, and fire departments
- # Public notices, public meetings, and site security
- # Prompt waste disposal
- # Equipment and material deliveries

5.1.3 Management Emphasis on Safety

Management emphasis on safety is a key component of site safety management. Project managers should wear appropriate safety equipment, maintain safety as a routine topic of planning and progress meetings, and recognize safe employees and discipline unsafe employees. Effective project managers send a clear and consistent message that safe behavior is expected and anything less will not be tolerated.

5.1.4 Communication

Possessing good "people skills" is often a significant factor in project safety because a good safety performance cannot be achieved without the project team communicating and working together. Project managers need to communicate safety expectations and instructions effectively. Site employees should understand the site safety procedures and be aware that compliance with them is required. They should feel comfortable to ask questions, report injuries, incidents, and safety concerns, and to provide general feedback and recommendations to the project manager.

Toolbox Safety Meetings offer not only the opportunity to provide technical safety instruction, but also provide occasion for feedback and suggestions from site employees. Personnel performing their craft can often suggest effective solutions to hazards, especially those pertinent to their trade. Overlapping hazards require effective communication and teamwork between the involved project staff.

5.1.5 Safe Work Environment

Project Managers and Field Team Leaders maintain a safe work environment by consistently implementing SHASP and adhering to OSHA standards and guidelines. Whether subcontractors have an approved SHASP of their own or follow an existing SHASP, site Project Managers should require that it be consistently implemented. The SHSO should be consulted when tasks change and when unanticipated hazards arise to discuss safety issues and amend health and safety procedures accordingly.

The first step in controlling hazards is the recognition of the hazard. Employees share responsibility for observing the work areas and procedures to identify potential or existing hazards. Project Managers and Field Team Leaders perform inspections (audits) to identify and direct the correction of unsafe conditions and work practices.

5.1.6 Safety Audits/Inspections

Safety audits may be conducted to identify unsafe conditions and work practices on site. Safety audits are an effective tool in identifying unsafe conditions and work practices. Safety audits may be conducted by project managers on a weekly basis, or when new substances, processes, procedures, or equipment are introduced that pose a new occupational safety and health hazard and when new or unrecognized hazards are observed. The Health and Safety Audit Criteria is located in Appendix D. The Project Safety Audit Form (Form K) is used for documenting audits.

5.1.7 Correcting Unsafe Conditions

Unsafe conditions noted during safety audits are assigned to a responsible person(s) for required follow-up action. The project manager and SHSO review safety audits to assure follow-up actions adequately control the hazard(s). Project managers and the SHSO will not close a Site Safety Audit Report file until the required follow-up action is complete.

For situations presenting an imminent hazard to employees, the auditor directs work to cease and workers to exit the area immediately until the hazards are controlled. The SHSO and project manager have the authority to stop work until hazards are abated.

Hazards shall be controlled as quickly as possible and in a timely manner, based on the severity of the hazard as determined by the project manager or the SHSO.

5.2 Standard Site Procedures

Due to the diverse nature of activities performed, there are a number of regulations and standards that must be considered during the performance of activities. In

addition, there are standard procedures that are applicable to activities performed at all hazardous, or potentially hazardous, waste sites. This section summarizes some of the key OSHA standards and procedures that may be applicable to various activities.

The following project health and safety program rules are adopted for the protection of all persons involved with activities on all projects. These rules apply to management, owner, and site personnel as well as visitors while on the job site. These rules are general in nature and are not to be considered all-inclusive, nor do they relieve contractors, subcontractors, or their employees from applicable occupational health and safety regulations promulgated by governmental authorities.

5.2.1 Housekeeping

Leads, hoses, and extension cords shall be hung up with a nonconductive material, off all floors, stairways, and walkways. Trash such as drinking cups, cans, and scraps from lunch are not to be thrown down, but disposed of properly in marked containers.

Available material, equipment, concrete forms, pipe, etc. are to be stacked orderly away from walkways, doors, stairways, and ladders.

Oil, grease, and other such liquid spills shall be cleaned up at the time of spill and are not to be left unattended.

Each person is responsible for housekeeping in his or her respective work areas.

Where such items as protruding rebar or anchor bolts create a tripping hazard, they shall be properly protected and conspicuously marked.

5.2.2 Personal Protective Equipment

Eye Protection – Safety glasses shall be worn at all times. Safety goggles shall be worn when possible eye hazards are present. Full-face shields shall be worn while grinding, chipping concrete, or when possible hazards are present.

Hard Hats – Hard hats shall be worn at all times in areas identified as hard hat areas.

Shoes – Steel-toe safety boots or shoes meeting the requirements of ANSI 241.1 where required.

Shirts and Pants – Shirts covering the full trunk and shoulders are required. Tanktops or midriff shirts are not allowed. Cut-off jeans or shorts will not be worn on the job site.

Hearing Protection – Hearing protection shall be worn when working in excessively noisy areas.

Respiratory Protection – Respiratory protection shall be worn when required.

Vehicle Safety – Seat belts shall be worn in all vehicles.

5.2.3 Fall Protection

Fall protection is required 100 percent of the time when exposed to a fall in excess of six feet or when required by additional rules. One hundred percent fall protection is required whether climbing, traveling from point A to point B, connecting structural steel, or erecting scaffolds or other temporary platforms. No employee or work operation is exempt from the 100 percent fall protection requirement.

When not protected by any other means of fall protection, such as safety nets or scaffold with proper guardrails, employees shall use full body harnesses, lanyards with double-locking snap hooks, and an adequate anchorage (fall arrest equipment). To achieve 100 percent fall protection, employees may need to use a double lanyard system and/or vertical or horizontal lifelines, retractable lifelines, or other approved positioning devices.

Employees shall rig fall arrest equipment so that they can neither free-fall more than six feet nor contact any lower object. Anchorage points for fall arrest equipment shall be capable of supporting twice the potential impact energy of an employee free falling six feet or the distance permitted by the system, whichever is less. Anchorage points for fall arrest equipment shall be located above the employee's body harness attachment point where practical.

When vertical lifelines are used, a separate lifeline shall protect each employee. The lifeline shall be properly weighted at the bottom and terminated to preclude a device such as a rope grab from falling off the line.

Horizontal lifelines should be limited to two persons at one time between supports and maintain a safety factor of at least two.

Prior to each use, employees shall visually inspect all fall arrest equipment for cuts, cracks, tears or abrasions, undue stretching, overall deterioration, mildew, operational defects, heat damage, or acid or other corrosion. Equipment showing any defect shall be withdrawn from service. All fall arrest equipment subjected to impacts caused by a free fall or by testing shall be removed from service.

Employees should store all fall arrest equipment in a cool dry place not subjected to direct sunlight.

Employees shall not use fall arrest equipment until they have been properly trained and show an understanding of its use.

Fall arrest equipment shall not be used for any other purpose, such as tow ropes or hoist lines.

Proper guardrails shall be installed on open sides of all walkways and runways where the fall distance exceeds four feet. Proper guardrails shall be installed on open sided

floors where the fall distance exceeds six feet. All floor openings or floor holes shall be protected by guardrails or hole covers. If hole covers are used, they shall be strong enough to support the maximum intended load, secured against displacement, and properly labeled.

When operating a scissor lift work platform, the lift shall have guardrails on all open sides, with the door access chains or rails in place.

Employees operating aerial lifts shall wear a body harness and lanyard attached to the aerial lift. Employees shall not attach the lanyard to an independent structure.

Employees riding in a crane suspended work platform shall wear a body harness and lanyard attached to the grab rail of the platform.

Employees working on wall forms or rebar shall wear a body harness lanyard and/or positioning device when exposed to a fall in excess of six feet. Position devices shall be rigged to prevent a free fall greater than 24 inches.

Stairs, ladders, or ramps shall be provided for all access ways where there is a change in elevation greater than 19 inches.

When guardrails are used for fall protection, they shall consist of a top rail, intermediate rail, and toeboard. The top rail shall have a vertical height of 42 inches, the midrail shall be at 21 inches, and the toe board 4 inches. When wood railings are used, the post shall be of at least 2 inch by 4 inch stock spaced not to exceed 8 feet, the top rail shall be of at least 2 inch by 4 inch stock, and the intermediate rail shall be of at least 1-inch by 6-inch stock. If pipe is used, it shall be at least 1½ inch nominal diameter. If structural steel is used, it shall be of 2 inch by 2 inch by 3/8-inch angles or equivalent. If wire rope is used for railings, it shall have a diameter of at least 2 inches and shall be stretched taut to allow no more than a 3-inch deflection.

Manila or synthetic rope shall not be used as guardrails.

Employees shall not stand or sit on guardrails.

Personal fall arrest systems shall not be attached to guardrail systems.

5.2.4 Welding and Cutting

Before performing welding, cutting, grinding, or any other "hot work" in a hazardous area on a project site, employees shall obtain a Hot Work Permit (Form D). Hazardous areas are those areas where there is the presence or the potential of the presence of flammable or combustible materials, liquids, gases, vapors, mists, or dusts.

Only experienced and properly trained persons shall perform welding and cutting. Before welding or cutting is started, the area shall be inspected for potential fire hazards.

When welding or cutting in elevated positions, precautions shall be taken to prevent sparks or hot metal from falling onto people or flammable material below.

Suitable fire extinguishing equipment shall be immediately available at all locations where welding and cutting equipment is used.

Welders or their assistants shall not carry matches when engaged in welding or cutting operations.

A fire watch shall be maintained wherever welding or cutting is performed in locations where combustible materials present a fire hazard. A fire check shall be made of the area two hours after completion of welding.

Where combustible materials such as paper clippings, coal, or wood shavings are present, the floor shall be swept clean for a radius of 35 feet before welding. Combustible floors shall be kept wet or protected by fire-resistant shields. Where floors have been wetted down, personnel operating arc welding or cutting equipment shall be protected from possible shock.

To protect the eyes, face, and body during welding and cutting, the operator shall wear an approved helmet or goggles, proper protective gloves, and clothing. Helpers or attendants shall wear proper eye protection. Other employees shall not observe welding operations unless they use approved eye protection.

Proper eye protection shall be worn to guard against flying particles when the helmet or goggles are raised.

Machinery, tanks, equipment, shafts, or pipes that could contain explosive or highly flammable materials shall be thoroughly cleaned and decontaminated prior to the application of heat.

In dusty or gaseous spaces where there is a possibility of an explosion, welding or cutting equipment shall not be used until the space is adequately ventilated.

Welders shall place welding cable, hoses, and other equipment so that it is clear of passageways, ladders, and stairways.

Where the work permits, the welder should be enclosed in an individual booth or shall be enclosed with noncombustible screens. Workers or other persons adjacent to the welding areas shall be protected from rays by shields or shall be required to wear appropriate eye and face protection.

After welding or cutting operations are completed, the welder shall mark the hot metal or provide other means of warning other workers.

Potentially hazardous materials are materials used in fluxes, coatings and coverings, filler metals used in welding and cutting, or materials released to the atmosphere during welding or cutting operations. While welding or cutting, adequate ventilation

or approved respiratory protection equipment shall be used. Special precautions shall be taken when using materials that contain cadmium, fluorides, mercury, chlorinated hydrocarbons, stainless steel, zinc, galvanized materials, beryllium, and lead. Employees shall refer to the Hazard Communication Program for specific requirements pertaining to the above listed hazardous materials (Section 6).

Gas Welding and Cutting – Only approved gas welding or cutting equipment shall be used. Approved backflow check valves shall be used on gas welding rigs in both gas and oxygen lines. Welding hose shall not be repaired with tape. Matches shall not be used to light a torch; a torch shall not be lighted on hot work. A friction lighter or other approved device shall be used. Oxygen, acetylene, or fuel gas cylinders shall not be taken into confined spaces.

Electric Welding – Only approved electric welding equipment shall be used. The electric welding machine shall be properly grounded prior to use. Rules and instructions supplied by the manufacturer or affixed to the machine shall be followed. Welders shall not strike arc with an electrode whenever there are persons nearby who might be affected by the arc. When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contacts with employees or conducting objects. When the welder must leave his work or stop work for any appreciable length of time, or when the welding machine is to be moved, the power supply switch to the equipment shall be opened.

5.2.5 Rigging Equipment

All rigging equipment shall be sufficient strength, proper type, and safe for its intended use.

Rigging equipment shall not be loaded in excess of its recommended safe working load.

Prior to each use, all slings, fastenings, and attachments shall be inspected, by a competent person, for damage or defects. Damaged or defective equipment shall be immediately removed from service.

Makeshift lifting devices formed from bolts, rods, or reinforcing steel shall not be used.

Slings shall not be shortened with knots, bolts, or other makeshift devices.

Slings used in a basket hitch shall have the load balanced to prevent slippage.

Slings shall be securely attached to the load by the use of hooks with retaining devices or by the use of shackles or other positive latching device.

Slings shall be padded or protected from the sharp edges of their loads.

A sling shall not be pulled from under a load when the load is resting on the sling.

Slings shall be long enough to provide the maximum practical angle between the sling leg and the horizontal plane of the load.

Shackle pins shall never be replaced with bolts or other non-approved devices.

Only hooks with approved retaining devices shall be used. Hooks shall never be rigged so that they are points loaded at the tip of the hook unless they are designed for that purpose. The load shall be securely seated in the saddle of the hook.

When eyebolts are used, care shall be taken to ensure the bolt is not side loaded.

Chain falls, come-alongs, and other such devices shall not be loaded beyond their rated capacities.

Chain falls, come-alongs, and other such devices shall always be rigged for a straight pull.

The chain or hoist cable for chain falls, come-alongs, or other such devices shall not be wrapped around a load and used in place of a sling unless specifically designed for that purpose.

5.2.6 Excavation

Before excavation work begins, a Trenching and Excavation Notice shall be obtained. A separate permit must be obtained for each excavation (Form E).

All excavations five feet deep or deeper, and excavations shallower than five feet in unstable soil shall be sloped, braced, or shored to prevent cave-ins.

All excavations four feet deep or deeper shall have a ladder for access into the excavation with no more than 25 feet of lateral travel in any direction.

All excavated and available material shall be retained two feet or more from the edge of the excavation.

All excavations shall be barricaded with the appropriate barrier tape and other protective devices as required.

When entering an excavation that may be considered a hazardous environment by site safety representatives, proper personal protective equipment must be worn.

Full compliance with 29 CFR 1926.650 through .652 is required.

5.2.7 Ladders

Wooden ladders shall not be painted so as to obscure a defect in the wood; only a clear, nonconductive finish shall be used.

All ladders shall be inspected frequently and regularly. Ladders with weakened, broken, or missing steps, broken side rails, or other defects shall be tagged and removed from service.

Ladders and scaffolds shall be sufficiently strong for their intended use.

Portable metal ladders shall not be used in the vicinity of energized electrical circuits. (Exception: Such ladders may be used in specialized work, such as high voltage substations, where nonconductive ladders might present a greater hazard. These ladders shall be properly marked.)

Ladders shall not be placed in front of doors opening toward the ladder unless the door is open, locked, or guarded.

When ascending or descending ladders, employees shall have both hands free and shall face the ladder.

Only one employee shall work from a ladder at one time (except for hook type ladders). If two employees are required, a second ladder shall be used.

Ladders shall not be used as scaffold platforms.

Boxes, chairs, etc. shall not be used as ladders.

Straight Ladders

Portable straight ladders shall not be used without nonskid bases.

The ladder shall be placed so that the distance between the bottom of the ladder and the supporting point is approximately one-fourth of the ladder length between supports.

Straight ladders shall not be climbed beyond the third step from the top.

When working from a portable ladder, the ladder must be securely placed, held, tied, or otherwise made secure to prevent slipping or falling.

When dismounting from a ladder at an elevated position (as at a roof), the employee shall ensure that the ladder side rails extend at least three feet above the dismount position, or that grab bars are present.

Employees shall wear a body harness and lanyard, and tie off to a secure anchor whenever both hands must be used for the job or are exposed to a fall in excess of six feet.

Ladders shall not be spliced together to form a longer ladder.

A ladder shall not be placed against an unsafe support.

Employees climbing a ladder with a fall exposure greater than 24 feet shall be protected by an approved cage, ladder-climbing device, or by the use of personal fall arrest equipment.

Step Ladders

The top two steps shall not be used.

Stepladder legs shall be fully spread and the spreading bars locked in place.

Stepladders shall not be used as straight ladders.

When an employee is working on a step ladder over six feet high, the employee shall use a body harness and lanyard attached to a substantial anchor.

5.2.8 Material Handling

An employee shall obtain assistance in lifting heavy objects or power equipment shall be used. Back belts or back braces shall be used as required.

When two or more persons carry a heavy object that is to be lowered or dropped, there shall be a prearranged signal for releasing the load.

When two or more persons are carrying an object, each employee, if possible, should face the direction in which the object is being carried.

The right way to lift is easiest and safest. Crouch or squat with the feet close to the object to be lifted, secure good footing, take a firm grip, bend the knees, keep the back vertical, and lift by bending at the knees and using the leg and thigh muscles. Employees shall not attempt to lift beyond their capacity. Caution shall be taken when lifting or pulling in an awkward position.

Employees should avoid twisting or excessive bending when lifting or setting down loads.

When moving a load horizontally, employees should push the load rather than pull it.

When performing a task that requires repetitive lifting, the load should be positioned to limit bending and twisting. The use of lift tables, pallets, and mechanical devices should be considered.

When using such tools as screwdrivers and wrenches, employees should avoid using their wrists in a bent (flexed), extended, or twisted position for long periods of time. Employees should maintain their wrists in a neutral (straight) position.

When gripping, grasping, or lifting an object such as a pipe or board, the whole hand and all the fingers should be used. Gripping, grasping, and lifting with just the thumb and index finger should be avoided.

5.2.9 Hand Tools

All tools, regardless of ownership, shall be of an approved type and maintained in good condition. (Tools are subject to inspection at any time. A foreman has the authority and responsibility to condemn unserviceable tools, regardless of ownership.)

Defective tools shall be tagged to prevent their use or they shall be removed from the jobsite.

Employees shall always use the proper tool for the job performed.

Hammers with metal handles, screwdrivers, knives with metal continuing through the handle and metallic measuring tapes shall not be used on or near energized electrical circuits or equipment.

Tools shall not be thrown from place to place or from person to person; tools that must be raised or lowered from one elevation to another shall be placed in tool buckets or firmly attached to hand lines.

Tools shall never be placed unsecured on elevated places.

All impact tools such as chisels, punches, drift pins, etc., that become mushroomed or cracked shall be dressed, repaired, or replaced before further use.

Chisels, drills, punches, ground rods, and pipes shall be held with suitable holders or tongs (not with the hands) while being struck by another employee.

Shims shall not be used to make a wrench fit.

Wrenches with sprung or damaged jaws shall not be used.

Pipe shall not be used to extend a wrench handle for added leverage unless the wrench was designed for such use.

Tools shall be used only for the purposes for which they have been approved.

Tools with sharp edges shall be stored and handled so that they will not cause injury or damage. They shall not be carried in pockets.

Wooden handles that are loose, cracked, or splintered shall be replaced. The handle shall not be taped or lashed with wire.

All cutting tools such as saws, wood chisels, knives, or axes shall be kept in suitable guards or in special compartments.

Tools shall not be left lying around where they may cause a person to trip or stumble.

When working on or above open grating, a canvas or other suitable covering shall be used to cover the grating to prevent tools or parts from dropping to a lower level where others are present, or the danger area shall be barricaded or guarded.

The insulation on hand tools shall not be depended upon to protect users from shock.

5.2.10 Portable Electric Tools

The noncurrent carrying metal parts of portable electric tools such as drills, saws, and grinders shall be effectively grounded when connected to a power source unless:

- # The tool shall be an approved double-insulated type.
- # The tool shall be connected to the power supply by means of an isolating transformer or other isolated power supply, such as a 24-volt DC system.

All power tools shall be examined prior to use to ensure general serviceability and the presence of all applicable safety devices. The electric cord and electric components shall be given an especially thorough examination.

Power tools shall be used only within their capability and shall be operated in accordance with the instructions of the manufacturer.

All tools shall be kept in good repair and shall be disconnected from the power source while repairs are being made.

Electrical tools shall not be used where there is a hazard of flammable vapors, gases, or dusts.

All power tools and cord sets shall be protected by ground fault circuit interrupters (GFCI).

5.2.11 Pneumatic Tools

Compressed air and compressed air tools shall be used with caution.

Pneumatic tools shall never be pointed at another person.

Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.

Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

Compressed air shall not be used for cleaning purposes except when reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

Compressed air shall not be used to blow dust or dirt from clothing.

The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

The use of hoses for hoisting or lowering tools shall not be permitted.

All hoses exceeding ½-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure or disengagement of a connection.

Before making adjustments or changing air tools, unless equipped with quick-change connectors, the air shall be shut off at the air supply valve ahead of the hose. The hose shall be bled at the tool before breaking the connection.

Eye protection, foot protection, and other protective devices shall be worn when their use could reduce the possibility of injury.

Pneumatic tools shall be operated only by competent persons who have been trained in their use.

A pneumatic tool used where it may contact exposed live electrical parts shall have a nonconductive hose and an accumulator to collect moisture.

Employees shall not use any part of their bodies to locate or attempt to stop an air leak.

5.2.12 Cranes, Derricks, Hoisting Equipment

Only authorized persons shall be permitted in the cab or on the equipment.

Only those designated persons who are trained and qualified shall operate the hoisting equipment.

Cranes shall be inspected on a monthly basis.

No person shall be permitted to ride the hook, sling, or load of any hoisting equipment.

Load limits as specified by the manufacturer shall not be exceeded under any circumstances.

Operating and maintenance procedures as specified by the manufacturer shall be followed.

Before a lift is attempted, the lifting mechanism shall be level and firmly supported with the hoist line centered over the center of gravity of the load to be lifted.

No load shall be lifted until its weight has been determined.

For the first lift of each day, the load shall be test lifted and the brakes checked (load lifted several inches and then tested).

With every load, the slings and bindings shall be checked and shall be readjusted as necessary to ensure safety and stability.

Signals to the equipment operator shall be given by one person designated to perform this task. The operator shall, however, obey a "stop" signal given by anyone.

No employee shall be under a suspended load or inside the angle of a hoist line. No employee shall stand or work near a cable, chain, or rope under tension unless the nature of his work requires it.

Hoist lines, ropes, or wire cables shall not be guided by hand when standing within reach of the drum or sheave.

Wire rope loops shall be made by proper splicing or mechanical clamping of the tail section. Wire rope clips shall not be used to form eyes in wire rope bridles or slings.

Operators shall not leave their position at the controls of cranes, hoists, derricks, or other lifting devices while the load is suspended.

Operators of cranes, derricks, hoists, and other hoisting equipment shall exercise extreme caution when in close proximity to energized lines or equipment. The operator shall keep the equipment at least 10 feet away from all lines energized up to 50 kV and 0.4 inch more for each 1 kV over 50 W.

Tag lines shall be used on all loads.

All spreader bars shall be tagged with the rated capacity.

5.2.13 Flammable and Combustible Liquids

"Danger – No Smoking" signs shall be posted around all flammable and combustible liquid storage areas.

All aboveground tanks shall have adequately sized concrete containment (slab and walls) to contain spills.

Tanks shall be vented with a pipe not less than 1¼ inch inside diameter and shall be 12 feet high from the adjacent ground level.

Tanks shall be kept 20 feet from buildings.

At least one 20 pound Class B fire extinguisher shall be kept between 25 feet to 75 feet from tanks.

All tanks shall be properly grounded.

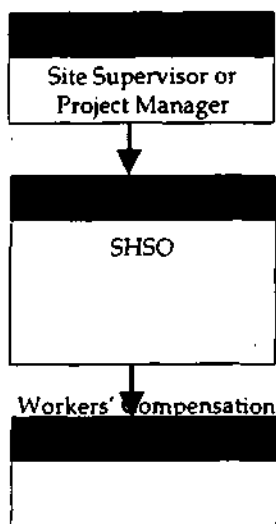
All tanks shall be labeled with the contents and owner's name.

5.3 Accident Reporting and Investigation

The Injury/Illness Report Form (Form A) will serve as the basis for the written reporting and investigating of all accidents resulting in employees receiving more than nonintrusive first aid. This includes any injury that requires offsite medical treatment or requires onsite first aid that hinders an employee's ability to function as normal (i.e., a sling or neck brace).

All such accidents are to be verbally communicated to the office SHSO or the project manager as soon as medical services are secured. These individuals will verbally notify the HSM within eight hours of the accident.

Procedure for Completion of Injury/Illness and Workers' Compensation Reports



Necessary medical services and employee care are to be secured prior to the initiation of reporting and investigation. The investigation is to be thorough and performed, at a minimum, by the injured employee's immediate supervisor. The results of the investigation are to be documented using the report form, to be signed by the investigator. The form is then sent to the appropriate Project Manager, who, following a review, is also required to sign the form before forwarding it to the HSM. Following the HSM's review and signature, a copy of the form is to be made for the office/project file.

Required completion of a customer form cannot be substituted for Form A (i.e., both forms are to be completed). The form is to be completed for all accidents, including contractor employees and subcontractor's employees. In the event of an accident to a subcontractor employee, the form and investigation are to be prepared and performed by the subcontractor.

If the accident requires off-site medical treatment, the project manager or site supervisor may also have to complete a worker's compensation report. These reports vary from state to state; check with the HSM for appropriate forms.

5.3.1 Follow Up

If the injury/illness resulted from the uncontrolled release of hazardous material, the HSM is to be notified immediately so that discussions with the occupational physician can occur to determine if additional biological monitoring should be prescribed.

As soon as practical, following the initial medical treatment, the injured employee is to be scheduled into the clinic that administers the annual examinations for the

injured employee's office. This is necessary to ensure that the employee receives quality medical treatment during any type or recovery period. This does not apply to a subcontractor employee.

Accident reporting procedures that are client-specific and applicable are also to be enacted at this time.

The HSM and the SHSO will follow up with the project manager to ensure that corrective action, if identified in the "Injury/Illness Report Form," has been implemented.

Section 6 Training

6.1 Introduction

Ensuring that employees have the appropriate skills to perform the tasks assigned to them safely is a key accident prevention tool. The three main goals of employee training are:

- # Train employees to identify and evaluate hazards correctly
- # Give employees the technical understanding of how to work in a safe manner
- # Promote safety awareness so that employees develop the attitude to want to work in a safe manner

6.2 Initial Training

Employees are trained when initially assigned or new to the hazards and precautions applicable to their work; when transferred to a new job; and when processes, hazards, or controls change.

The contents of initial training may include:

- # Training required under OSHA's Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120)
- # Comprehensive training on hazards and precautions specific to the employee's work
- # A discussion of employee rights and responsibilities under OSHA regulations
- # An explanation of who to contact with questions or concerns
- # Training required under OSHA's Safety and Health Regulations for Construction, Hazardous Waste Operations and Emergency Response Standard (29 CFR 1926.65)
- # A competency course, such as the OSHA 500 10-hour Construction Outreach Program
- # A review of this Health and Safety Program
- # A review of the Employee Safety Handbook

6.3 Refresher Training

Longer-service employees typically require refresher training when:

- # Safety rules and regulations change
- # Organizational structure changes (e.g., training in whom to contact)
- # New equipment or procedures are introduced
- # Additional skills, such as first aid, are needed
- # Annual refresher training
- # Site-specific refresher training

6.4 Supervisory Training

In addition to the initial and refresher training requirements, those individuals who supervise individuals performing activities at a hazardous, or potentially hazardous, waste site are required to have an additional 8 hours of training. Topics included in this training include: CSHASP, Chemical and Physical Hazard Recognition, Spill Containment, Contingency Plans, Health Hazard Monitoring; i.e., subjects that help them perform activities in a safe and healthy fashion.

6.5 Site Orientation

A thorough site orientation meeting is held to review the health and safety procedures required on site. The CSHASP is discussed, emergency procedures are reviewed, and site security is explained. All personnel assigned will have reviewed materials increasing their asbestos hazard awareness. Subcontractor coordination is addressed, if applicable. The site orientation is documented with an Employee Meeting Record Form (Form B) and the CSHASP signature page. Site orientation meetings are usually held by the Project Manager or the SHSO. Subsequent orientations are held as new site employees or subcontractors come on site. The Project Manager may choose to delegate some site orientations to the SHSO. The Project Manager, however, is still responsible for ensuring that the meetings are held.

6.6 Toolbox Safety Meetings

Site-specific discussions on work tasks and hazard control maintains employee safety awareness. Productive safety meetings include a review of actual field conditions and feedback and suggestions from employees. These site safety meetings are referred to as Toolbox Safety Meetings.

The SHSOs hold Toolbox Safety Meetings on a routine basis, at a minimum. On certain projects, Toolbox Safety Meetings may be required daily. The degree of hazards, injuries, or accidents, and the number of employees/ contractors are factors that may warrant more frequent Toolbox Safety Meetings. Toolbox Safety Meetings discuss specific work tasks, the hazards involved, and controls for those hazards. The first Toolbox Safety Meeting is the site orientation and CSHASP review on the first day of the job.

Documentation of the meeting is recorded on the Employee Meeting Record (Form B), located in Appendix A. When only one or two employees are onsite, they may choose to attend the Toolbox Safety Meeting held by the subcontractor rather than hold their own. In this case, documentation of the personnel in attendance should be obtained and kept in the project files. Noting attendance in the log book alone is not acceptable.

6.7 Subcontractor Training

Subcontractors are solely responsible for ensuring appropriate training for their employees, agents, and lower tier subcontractor employees.

Depending on site operations, joint subcontractor Toolbox Safety Meetings may be appropriate. These joint meetings offer the opportunity to coordinate and improve common site safety procedures, such as emergency evacuation and decontamination. Joint Toolbox Safety Meetings are held by the contractor SHSO with subcontractors in attendance.

In addition to the joint Toolbox Safety Meeting, the subcontractors still must hold their own specific safety meetings in their area of expertise. The joint Toolbox Safety Meeting is in addition to the subcontractors' own safety meetings and does not serve to replace them.

6.8 Record Keeping

Records of site-specific training and weekly Toolbox Safety meetings are maintained by the project manager on the Employee Meeting Record (Form B), and copies are submitted at project, or more frequently if necessary, to the SHSO.

Originals of all project-generated forms, including health and safety forms, are kept with the other project records in the project file. Documentation of training is maintained for a minimum of three years.

6.9 Hazard Communication

Employees have the right to know about the hazards of materials they work with. The right to know program implements the requirements of OSHA's Hazard Communication Standard (29 CFR 1910.1200). OSHA Standard 29 CFR 1910.1200 "Hazard Communication Standard" requires that all employees handling or using materials which may be hazardous, be advised and informed as to the hazard potential associated with those materials. The following sections outline the program designed for compliance with the scope and intent of the standard. The main elements of this program include a health and biological surveillance program, employee education and training program, and employee exposure determination program. It is only through the proper implementation and maintenance of such programs that maximum employee health and safety protection can be assured.

Each contractor's Health and Safety Manager (HSM) has overall responsibility for implementation of the Hazard Communication Program. The SHSO will be responsible to ensure that programs have been implemented by the contractors.

6.9.1 Material Safety Data Sheets

A Material Safety Data Sheet (MSDS) is an information sheet that provides specific identification information about a chemical or material. The MSDS information may include:

- # Ingredients and hazards
- # Physical data
- # Fire and explosion information
- # Reactivity data
- # Health hazard information
- # Spill risk and disposal procedures
- # Special protection information
- # Special precautions required for use

It is the manufacturer's responsibility to provide this information for any materials containing hazardous or potentially hazardous ingredients.

A comprehensive collection of MSDSs exists. Prior to any project startup, it is the contractors responsibility to ensure that MSDSs are available for any material expected to be utilized or encountered during project work which represents a potential health and safety hazard to contractor employees through possible exposure. MSDSs should be secured from the manufacturer and/or project owner.

Copies of all MSDSs for materials expected to be utilized or encountered during project work are to be available at each project site, and each employee is to be made aware that these exist and are available.

6.9.2 Labels

It is the responsibility of the Site Health and Safety Officer (SHSO) to ensure that all potentially hazardous materials brought to a project site are labeled as to the contents of each container and the appropriate usage of hazard warnings.

6.9.3 Nonroutine Tasks

When employees are required to perform hazardous nonroutine tasks (i.e., confined space entry, line breaking, tank cleaning, etc.), a special training session will be

conducted to inform those employees as to the hazardous materials to which they may be exposed and the proper procedures and personal protective equipment to be utilized to minimize exposure potential.

6.9.4 Education and Training

Prior to any field project startup, a pre-project training session must be conducted with all employees expected to be involved with project work. Included in this training session are the following:

- # An overview of the hazard communication requirement
- # A review of the chemicals present and anticipated to be encountered during the course of the project
- # Identification of the location and availability of the written hazard communication program, the inventory of chemicals expected to be utilized and/or encountered, and the MSDSs for those materials
- # Discussion of the methods and observation techniques that may be used to detect the presence of a release of hazardous chemicals in the work area
- # Discussion of how to lessen or prevent exposure to hazardous workplace chemicals
- # Instruction in emergency procedures to follow if employees are exposed to hazardous chemicals
- # An explanation of the hazard communication program, including how to read labels and MSDSs to obtain appropriate hazard information
- # An explanation of the proper use of personal protective equipment

6.9.5 Informing Other Employees

Each contractor will ensure that their employees have been provided access to information on the hazardous chemicals at a project site. It is the responsibility of the SHSO to ensure that the following information has been provided:

- # Where the MSDSs are located
- # The name and location of the hazardous chemicals to which employees may be exposed and the appropriate protective measures
- # An explanation of the labeling system

Section 7 Medical Surveillance

A medical surveillance program consists of a combination of:

- # Baseline, annual, interim, exit, and return to work examinations
- # Services for the evaluation of occupationally related injuries and illnesses
- # Emergency medical services required to stabilize severely injured or ill patients prior to their transport to an offsite medical care facility

The medical surveillance program is designed and administered by a board certified, occupational physician.

All employees are instructed that they are to advise management of prescription drug usage during the performance of any assigned activities. Also, female employees are encouraged to advise their immediate supervisor of any change of physical status related to pregnancies. Medical monitoring protocol for personnel assigned to hazardous, or potentially hazardous, waste sites is provided in Table 7-1.

Table 7-1
Medical Monitoring Protocol

Exam Components	Baseline ¹	Annual ²	Interim	Exit
Blood and Urine Specimen	Yes	Yes	Yes	Yes
Vital Signs	Yes	Yes	Yes	Yes
Vision Screening (to include peripheral & color)	Yes	Yes	Yes	Yes
Dipstick Urine Analysis	Yes	Yes	Yes	Yes
Audiometry	Yes	Yes	No	Yes
Spirometry	Yes	Yes	Yes	Yes
EKG	3	3	No	3
Chest X-Ray	Yes	3	No	3
Review of History	Yes	Yes	Yes	Yes
Physical Exam	Yes	Yes	Yes	Yes

1. Only do an X-ray if not done within the last 12 months
2. Only do an X-ray if not done within the last 3 years
3. For medical indications only

All contractor field personnel will be provided with a thorough, initial medical examination to assess fitness for the job and provide baseline health data for subsequent reference. Examinations will be repeated annually unless abnormal test results or other problems dictate more frequent observation.

During the medical examination, employees will be evaluated for their ability to wear respiratory protection and other protective equipment (e.g., extensive clothing ensembles). This evaluation will include, as a minimum, an examination of the cardiopulmonary system (i.e., forced vital capacity (FVC) and forced expiratory volume C 1 second (FEV 1.0)). When indicated by the physician, other tests of the respiratory and cardiovascular systems will be performed on the basis of an individual's past history, findings of the above evaluation, and/or the type of equipment the individual may be required to use.

An example medical authorization form is provided as Form H.

7.1 Baseline Medical Examination

The baseline medical examination is conducted to determine whether an employee is physically and mentally suitable to perform work requirements and assignments as outlined in the job description; to provide baseline values for comparison with later test results; and to evaluate the employee's ability to utilize personal respiratory protection and other protective equipment. The baseline medical examination will include, as a minimum:

- # A medical and work history
- # Physical examination, which includes vital signs and an evaluation of all major organ systems
- # Audiogram
- # Vision screening
- # Chest X-ray (only if there was no X-ray within 12 months)
- # Blood chemistry screen and profile
- # Urinalysis
- # Spirometry

7.2 Annual/Interim Medical Examinations

Annual/interim medical examinations will be given every 12 months or more frequently if indicated by substandard performance; evidence of particular stress or difficulty in using personal respiratory protection; signs/symptoms of illness commonly associated with chemicals present at the site; or if employees were exposed while unprotected. Employees experiencing signs and symptoms or having complaints must immediately report the problem to the Health and Safety Coordinator (HSC), the SHSO or the Health & Safety Manager (HSM). Employees having abnormal test results will also be monitored and rested by the physician at

intervals prescribed in appropriate federal codes (i.e., 29 CFR, 1926.52, 1910.134, 1910.1001, 1910.1025, 1910.1018, and 1910.120).

Components of the annual medical exam are similar to the baseline examination. Following the annual or interim examination, the physician will submit in writing to the HSC and the HSM any medical and safety restrictions required, and the physician will inform the employee of the test results. The physician will indicate the reasons for restricting work and will submit an appropriate plan of medical supervision for any work-related illnesses or injuries.

Note: There are site-specific contaminants that may warrant specific biological monitoring. When these types of contaminants are identified, the contaminants and the work to be performed are discussed with the occupational physician.

7.3 Exit Medical Examination

If employment is terminated voluntarily or involuntarily, an exit medical examination will be offered. The content of the exit medical examination will incorporate those elements included in the baseline examination. Signs or symptoms of work-related illnesses will be reported immediately.

An employee who refuses to submit to an exit examination will be advised of the potential hazards and will complete a waiver form stating that the employee has been advised of the need for an examination, has voluntarily refused an examination, and waives the right to future litigation relative to conditions which may have been detected in the course of the examination.

An attempt to contact employees who terminated employment without an exit examination will be made. A record of efforts to contact employees who leave employment without notice and without undergoing an exit examination will be kept. The record will become part of the employee's medical records.

7.4 Return-to-Work Examinations

An employee desiring to return to work following a leave of absence due to injury or illness, or return to full status from a restricted work period resulting from an injury/illness will have to obtain clearance by means of a physical examination. Extent of the physical examination will be determined by the occupational physician and will be performed at the locally established medical services provider.

7.5 Access to Employee Medical Records

In compliance with 29 CFR 1910.120, all employees and their designated representatives have access to their own medical records developed as part of this program. Employees must request the records in writing and specify the name, address, and telephone number of the physician who is to receive the records. Such requests are to be sent to the HSM. The request for medical records is shown as Form I.

Section 8

Personal Protective Equipment

Activities to be performed during the project will frequently require the use of clothing and equipment that shields and/or isolates employees from chemical and physical hazards that may be encountered.

In order to prescribe personal protective equipment requirements effectively, the nature and extent of potential chemical and physical hazards associated with various activities need to be assessed. Prior to mobilization, a detailed review of the project is completed. This includes a review of the site history, types and quantities of materials handled at the site, types of operations performed at the project site, and types of activities to be performed during the course of the project.

From this review, personal protective equipment is selected based on the reasonable anticipation of exposure to the chemical and physical hazard exposure potential.

8.1 Levels of Protection

Each type of protective equipment has been designed specifically to protect against a reasonably anticipated chemical and physical hazard. In order to standardize personal protective equipment ensembles, "levels of protection" have been defined to address those chemical and physical hazards that may be present at the site. The levels of protection are defined accordingly:

<i>Level A</i>	This level is worn when the highest level of respiratory, skin, and eye protection is anticipated as being required.
<i>Level B</i>	This level is worn when the highest level of respiratory protection is anticipated as being required, with a lesser level of skin protection being necessary.
<i>Level C</i>	This level is worn when criteria for air-purifying respirators are determined to be necessary and a lesser level of skin protection needed.
<i>Level D, Modified</i>	This level is worn when activities do not pose a problem from a respiratory protection point of view but may present a skin problem and where cross contamination via shoes needs to be considered.
<i>Level D</i>	This level is worn when activities and areas do not present a respiratory or skin hazard.

Detailed equipment, use, and limitations associated with each level of protection appear in Table 8-1.

Table 8-1
Levels of Protection

Level	Equipment	Protection Provided	Should be Used When:	Limiting Criteria
A	<p>Recommended:</p> <ul style="list-style-type: none"> Pressure-demand, full facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA Full-encapsulating, chemical-resistant suit Inner chemical-resistant gloves Chemical-resistant safety boots/shoes Two-way radio communications <p>Optional:</p> <ul style="list-style-type: none"> Cooling Unit Coveralls Long cotton underwear Hard hat Disposable gloves and boot covers 	<p>The highest available level of respiratory, skin, and eye protection</p>	<ul style="list-style-type: none"> The chemical substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either: <ul style="list-style-type: none"> Measured (or potential for) high concentration of atmospheric vapors, gases, or particulates Site operations and work functions involving a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through intact skin Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible Operations must be conducted in confined, poorly ventilated areas until the absence of conditions requiring Level A protection is determined 	<p>Fully encapsulating suit material must be impermeable to the substances involved</p>
B	<p>Recommended:</p> <ul style="list-style-type: none"> Pressure-demand, full-facepiece SCBA or pressure-demand supplied air respirator with escape SCBA Chemical-resistant clothing (coveralls and long-sleeved jacket; hooded, one-piece chemical splash suit; disposable chemical resistant one-piece suit) Inner and outer chemical-resistant gloves Chemical-resistant safety boots/shoes Hard hat Two-way radio communications <p>Optional:</p> <ul style="list-style-type: none"> Coveralls Disposable boot covers 	<p>The same level of respiratory protection but less skin protection than Level A.</p> <p>It is the minimum level recommended for initial site entries until the hazards have been further identified.</p>	<ul style="list-style-type: none"> The type and atmospheric concentrations of substances have been identified and require a high level of respiratory protection, but less skin protection. This involves atmospheres: <ul style="list-style-type: none"> With immediately dangerous to life or health (IDLH) concentrations of specific substances that do not represent a severe skin hazard or That do not meet the criteria for use of air-purifying respirators Atmosphere contains less than 	<p>Used only when the vapor of gases present are not suspected of containing high concentrations of chemicals that are harmful to skin or capable of being absorbed through the intact skin</p> <p>Use only when it is highly unlikely that the work being done will generate either high concentrations of vapors, gases, or particulates or splashes of material that will affect exposed skin</p>

Table 8-1
Levels of Protection

Level	Equipment	Protection Provided	Should be Used When:	Limiting Criteria
	<ul style="list-style-type: none"> • Face shield • Long cotton underwear 		19.5 percent oxygen <ul style="list-style-type: none"> • Presence of incompletely identified vapors or gases is indicated by direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the skin 	
C	Recommended: <ul style="list-style-type: none"> • Full-facepiece, air-purifying, cartridge-equipped respirator • Chemical-resistant clothing (coveralls and long-sleeved jacket; hooded, one-piece chemical splash suit; disposable chemical-resistant one-piece suit • Inner and outer chemical-resistant gloves • Chemical-resistant safety boots/shoes • Hard hat • Two-way radio communications Optional: <ul style="list-style-type: none"> • Coveralls • Disposal boot covers • Face shield • Escape mask • Long cotton underwear 	The same level of skin protection as Level B, but a lower level of respiratory protection.	<ul style="list-style-type: none"> • The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin • The types of air contaminants have been identified, concentrations measured, and a cartridge is available that can remove the contaminant • All criteria for the use of air-purifying respirators are met 	
D Modified	Recommended: <ul style="list-style-type: none"> • Chemical-resistant outer gloves • Disposable shoe covers • Work clothes • Safety boots/shoes • Safety glasses or chemical splash goggles • Hard hat 	No respiratory protection. Minimum skin protection.	<ul style="list-style-type: none"> • The atmosphere contains no known hazard • Work functions may involve skin contact with hazardous chemicals 	
	Recommended: <ul style="list-style-type: none"> • Work clothes • Safety boots/shoes • Safety glasses or chemical splash goggles • Hard hat 	No respiratory protection. Minimal skin protection.	<ul style="list-style-type: none"> • The atmosphere contains no known hazard 	

8.2 Use of Personal Protective Equipment

Use of personal protective equipment is required by OSHA regulations contained in 29 CFR 1910 and 29 CFR 1926, and is reinforced by EPA regulations in 40 CFR Part 300. These regulations include all individuals who may perform work at hazardous, or potentially hazardous, waste sites, when applicable. Types of protection, relevant to OSHA regulation, and the source of the regulation appear in Table 8-2.

Table 8-2
OSHA Standards for the Use of Personal Protective Equipment

Type of Protection	Regulation	Source
General	29 CFR 1910.132	41 CFR Part 50-204.7 General Requirements for Personal Protective Equipment
	29 CFR 1910.1000	41 CFR Part 50-204.5, except for Table Z-2, the source of which is American National Standards Institute, Z37 series ¹
	29 CFR 1910.1000-1045	OSHA Rulemaking
Eye and Face	29 CFR 1910.133(a)	ANSI Z87.1- ¹ Eye and Face Protection
Noise Exposure	29 CFR 1910.95	41 CFR 50-204.10 and OSHA Rulemaking
Respiratory	29 CFR 1910.134	ANSI Z88.2- ¹ Standard Practice for Respiratory Protection
Head	29 CFR 1910.135	ANSI Z41.1- ¹ Safety Requirements for Industrial Head Protection
Foot	29 CFR 1910.136	ANSI Z41.1- ¹ Men's Safety Toe Footwear
Electrical Protective Devices	29 CFR 1910.137	ANSI Z9.4- ¹ Ventilation and Safe Practices of Abrasive Blasting Operations
Eye and Face	29 CFR 1910.133(a)	ANSI Z87.1- ¹ Eye and Face Protection

¹ American National Standards Institute (ANSI), 1430 Broadway, New York, New York 10018

Personal protective equipment in use shall be inspected daily and maintained in serviceable condition. Items of personal issue shall be cleaned and sanitized as appropriate prior to being reissued to another employee. Defective or damaged personal protective equipment shall be taken out of service immediately.

8.2.1 Hard Hats

Hard hats are required at all times while on the construction site. Hard hats shall comply with the ANSI Z89.1 requirements.

8.2.2 Safety Glasses

Safety glasses are required at all times while on the construction site. Safety glasses shall comply with the ANSI Z87.1 requirements.

8.2.3 Respirators

Please refer to Section 9.

8.2.4 Hearing Protection

Employees shall use hearing protection when noise levels exceed the allowable limit. A Hearing Conservation Program shall be implemented if the allowable limits are exceeded.

Protection against the effects of noise exposure shall be provided when sound levels exceed those in the tables below. Noise exposure limits are generally applied as an eight-hour exposure limit of 85 dBA. For exposures of shorter or longer durations, the exposure limit may be adjusted as indicated in the table. Hearing Conservation Program elements are required to be implemented whenever employee noise exposures equal or exceed an eight-hour time-weighted average of 80 dBA. Hearing Conservation Program elements include exposure monitoring, audiometric testing, medical monitoring, and training. The dose criterion of 80 dBA for an eight-hour exposure is referred to as the Action Level.

Continuous Noise Permissible Exposure Limits

Duration (Hours)	Sound Level (dBA)*
16	80
8	85
4	90
2	95
1	100
0.5	105
0.25	110
0.125 or less	115

*Measured on the A-scale of a standard sound-level meter set at slow response.

Impulse Noise Permissible Exposure Limits

Sound Level (dBP)	Permitted Impulses/Day
140	100
130	1,000
120	10,000

*Peak sound-pressure level.

Section 9

Respiratory Protection

Following are information and guidelines necessary for the proper selection, use, and maintenance of respiratory protective devices. These guidelines are applicable to all employees performing duties requiring the use of respiratory protection and are designed to comply with 29 CFR 1910.134.

9.1 Definitions

Approved - Tested and listed as satisfactory by the National Institute for Occupational Safety and Health (NIOSH) and/or the Mine Safety and Health Administration.

Contaminant - A harmful, irritating, or nuisance material in concentrations exceeding those normally found in the ambient air.

Disinfection - The destruction of pathogenic organisms, especially by means of chemical substances.

Immediately Dangerous to Life or Health (IDLH) - An atmospheric concentration of any toxic, corrosive, or asphyxiant substance that poses an immediate threat to life, would cause irreversible or delayed adverse health effects, or would interfere with an individual's ability to escape from a dangerous atmosphere.

Oxygen-Deficient Atmosphere - An atmosphere containing 19.5 percent or less of oxygen by volume.

Particulate Matter - A suspension of fine solid or liquid particles or fibers in air such as dust, fog, fume, mist, smoke, or sprays.

Pneumoconiosis-Producing Dust - Dust which when inhaled, deposited, and retained in the lungs may produce signs and symptoms of pulmonary disease.

Respirator - An approved device designed to provide the wearer with respiratory protection against inhalation of a contaminated atmosphere and, for some devices, oxygen-deficient atmospheres.

Vapor - The gaseous state of a substance that is solid or liquid at ordinary temperature and pressure.

Dusts - Solid particles, mechanically produced, with a size ranging from submicroscopic to macroscopic.

Fumes - Solid particles generated by condensation from the gaseous state, generally after volatilization from molten metals, with a size usually less than one micrometer in diameter.

Mists - Suspended liquid droplets generated by condensation or by breaking up of a liquid with a size ranging from submicroscopic to macroscopic.

Gases - Substances that are gaseous at ordinary temperature and pressures.

9.2 General Requirements

Respirators will be considered an acceptable method of protecting the health of personnel only under the following circumstances:

When it has been determined that there are no feasible engineering or work practice controls that can be used to adequately control the hazard.

During intermittent, non-routine operations (one hour/day for one day/week).

During interim periods when engineering controls are being designed and/or installed.

During emergencies.

As part of a safety procedure where a possibility for an excessive or potentially hazardous condition has been defined.

Air purifying respirators may only be worn in atmospheres that contain at least 19.5 percent and not more than 23.5 percent oxygen.

Air purifying respirators may only be worn when contaminants of concern have warning properties below permissible exposure limits and/or threshold limit values, and must be discernable by the wearers, when the selected respirator provides the proper level of protection for reasonable anticipated exposure levels.

The multiplicity of hazards that may exist in a given operation requires a careful and intelligent respirator selection. The selection is made complex by the many types of respirators available. Each type has its special limitations, application, operational and maintenance requirements. For these reasons it is important that the individual responsible for the respiratory program be trained and knowledgeable in the basic principles of respiratory selection and use.

The standards governing the development of this program include but are not limited to the following:

American National Standard Institute (ANSI): Practices for Respiratory Protection, Z88.2-1992

OSHA: Respiratory Protection, 29 CFR 1910.134 and 29 CFR 1926.103

9.3 Medical Surveillance

Employees will not be assigned to tasks requiring the use of respiratory protection unless they have been determined to be physically able to wear such equipment in accordance with the Medical Surveillance Program described in Section 8.

9.4 Selection of Respiratory Protective Devices

Selection of respiratory protective devices for projects that require the use of such personal protective equipment is performed during the generation of SHASPs and/or AHAs as described in Section 6. Information contained in Table 9-1, "Protection Factors," is used in the selection process.

When selecting the correct respiratory protective devices, there are several factors that must be considered, including:

Nature of the Hazard. Before selecting a respirator, the nature of the inhalation hazard must be identified. Oxygen deficiencies, physical hazards, chemical properties, movement and work rate limitations, and actual chemical concentrations and warning properties are all factors that must be considered.

Nature of Operation. The details of the actual operation and/or process that is creating the hazard is important in selecting appropriate respiratory protection.

Respirator Capabilities and Limitations. There are limitations associated with each type of respiratory protection devices. These limitations are discussed in Table 9-2.

The SHSO and the HSM are responsible for the correct selection of respiratory protective devices. Generally speaking, when Level C personal protective equipment is required, it will consist of a full-face respirator with an MSA GMC-H (NIOSH approval number TC-23C-1283) cartridge, or, a half-face respirator with a P100 cartridges. When supplied air respirators are required, they will be equipped with emergency escape bottles.

The descriptions and limitations of respiratory protection devices included in Table 9-2 are extracted from 30 CFR 11.

**Table 9-1
Respiratory Protection Factors***

Respirator	Protection Factor
I. Particulate Filter Respirators - Powered air-purifying respirator with high-efficiency particulate filter (full-face). - High-efficiency particulate filter respirator with a full facepiece. - High-efficiency particulate filter respirator with a half facepiece.	1,000 100 10
II. Chemical Cartridge and Gas Masks - Powered air-purifying respirator with chemical cartridge (full-face). - Chemical cartridge respirator with a full facepiece. - Half-mask chemical cartridge respirator.	1,000 100 10
III. Combination Particulate and Gas/Vapor Air Purifying - Powered air-purifying respirator with chemical cartridge and high efficiency particulate filter (full-face). - Chemical cartridge respirator with a full facepiece, chemical cartridge, and filter. - Half-mask chemical cartridge respirator with a chemical cartridge and filter.	1,000 100 10
IV. Supplied-air Respirators Type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode, or with full facepiece, helmet, or hood operated in continuous flow.	1,000
Type C supplied-air respirator without full facepiece, helmet or hood, operated in pressure-demand or other positive pressure or continuous flow mode.	1,000
Supplied-air respirator with full facepiece helmet, or hood not operated in positive pressure or continuous mode.	50
Any other supplied-air respirator.	10
V. Self-contained Breathing Apparatus Combination respirator including a Type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure or continuous flow mode and an auxiliary self-contained breathing apparatus, operated in pressure-demand or other positive pressure mode.	10,000
Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive mode.	10,000
Self-contained breathing apparatus with a full facepiece operated in demand mode.	50
Self-contained breathing apparatus without a full facepiece.	10

* Adapted from ANSI Z88.2

Definition: Ratio of contaminant concentration outside respirator to inside.

Use: Allows calculation of maximum use concentration in which a particular type of respirator will provide adequate protection to wearer [i.e., $(PEL) \times (P.F.) = \text{maximum use concentration}$].

Table 9-2
Respiratory Protection Devices

General Description	Limitations	Requirements
Air Purifying Respirators		
Half-mask or full facepiece respirator equipped with air purifying units to remove gases, vapor, and particulate matter from the ambient air prior to its inhalation. Some air purifying respirators are power-operated and provide respirable air to the facepiece (or hood) under a slight positive pressure.	Do not protect against oxygen deficient (<19.5%) atmospheres or atmospheres that are immediately dangerous to life and health (IDLH). The method of purification is generally chemical or chemical group specific so they cannot be used in atmospheres that contain unknown concentrations of unknown materials. Also cannot be used in atmospheres containing chemicals that present a health risk below their odor or taste thresholds. The useful life of this type of respirator is limited to the concentrations of contaminants, the breathing demand of the wearer, and the removal capacity of the purification medium.	When Level C respiratory protection devices are specified, they will consist of a full-face respirator with an MSA GMC-H (NIOSH approval number TC-23C-1283) cartridge or equivalent. Alternative respirators and cartridges must be approved by the HSM.
Atmosphere-Supplying Respirators		
A respirable atmosphere is supplied independent of the ambient air surrounding the wearer. These devices provide protection against oxygen deficiency and most toxic atmospheres.	Some limitations of atmosphere supplying respirators include time limitations of supplied air, bulkiness of equipment, and inherent safety hazards associated with working while dragging an airline or while wearing an air cylinder.	SCBAs will be pressure-demand types of devices, and where appropriate, equipped with an emergency escape bottle.

9.5 Training

Respirators will not be issued to employees who have not been adequately trained in their use. At a minimum, all employees and supervisory personnel who may be required to wear respiratory protective devices will receive training in the following:

- # Problems associated with improper respirator usage.
- # The nature of hazards associated with airborne contaminants.
- # The capabilities and limitations of respirator types.
- # The proper care, use, and maintenance of respirators.
- # The performance of positive and negative field fit checks each time respiratory protection is donned. This includes the importance of the facepiece-to-face seal and of not using respirators when a good seal is not achievable.

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- # The fact that parts from different respirators are not interchangeable.
- # How to properly inspect respiratory protective devices prior to use.
- # Successful completion of a fit test for the specific respirator that is to be used.
- # Documentation of training is completed for each individual and maintained in the training tracking system. An example of the respirator training form documentation appears as Form J.

9.6 Fit Testing and Field Checks

Fit testing will be performed on all employees assigned to project work that may require the use of respiratory protective devices. Testing will be performed by the HSC or another trained and qualified individual in accordance with accepted fit test procedures. Documentation of fit testing is completed for each tested employee and maintained in the training tracking system. Positive and negative pressure field checks are performed immediately prior to use.

9.7 Inspection

All respirators are inspected before and after use. Respirators stored for emergency use only are inspected monthly. Inspections generally cover the following:

- # Condition of facepiece, connecting tubes, cartridges, and straps.
- # Condition of the lens. Lenses should be free of scratches and seated tightly in retainers.
- # Flexibility of all rubber parts. Deteriorated pieces should be replaced.
- # Condition of all valves. Exhalation and inhalation valves are to be checked to ensure correct seating.
- # On self-contained breathing apparatus (SCBA), air cylinder charges, regulators, and warning devices are to be inspected prior to use by individuals trained to perform these inspections. For units stored for emergency use, these inspections are to occur at least monthly.

9.8 Use, Maintenance, and Care

Employees are not assigned to tasks requiring the use of respiratory protection unless they have been determined to be physically able to wear such equipment, have been trained, and have completed a successful fit test.

Employees requiring the use of respirators must be clean shaven. Additionally, anything that interferes with the facepiece-to-face seal (i.e., glasses, long hair, skull caps, etc.) will not be permitted when respirators are required.

All respirators and cartridges are to be NIOSH/MSHA approved.

Only approved replacement parts will be used in respirator repair. Maintenance on self-contained breathing apparatus will only be performed by individuals certified by the manufacturer.

Respirators assigned to and worn by one individual will be cleaned and sanitized after each use. Extreme care is to be taken during the cleaning process to prevent damage from handling.

When not in use, respirators will be stored to protect them from physical damage, sunlight, extreme temperatures, and excessive moisture.

9.9 Breathing Air

When used, breathing air will be Grade D or better as per the specifications described by the American National Standard Institute.

Section 10

Site-Specific Health and Safety Plans

Site-specific health and safety plans (SHASPs) or Activity Hazard Analyses (AHAs) may be generated for all construction activities and hazardous waste sites. The complexity of each individual plan will vary as to the types of operations and the chemical and physical exposure hazard potential associated with each individual site.

At the start of each project, the project manager should complete the Preliminary Hazard Analysis (Form L). This form will provide an initial assessment of potential health and safety concerns on the project and help determine whether a complete SHASP or AHA is required.

Should a SHASP or an AHA be needed, it will serve as a vehicle for providing health and safety information to all individuals assigned to site activities and will be available onsite and reviewed by each individual employee before performing site activities. Documentation as to this review will be performed onsite. In general, the SHASP or AHA will be prepared, as a minimum, in accordance with the requirements of 29 CFR 1910 and 29 CFR 1926.

Pertinent reasons for the generation of a SHASP or an AHA are as follows:

- # To establish policies and procedures to protect employees and the public from potential site-specific health and safety hazards
- # To provide measures to minimize/eliminate accidents and injuries that may result from chemical and physical hazards associated with the site
- # To ensure that all aspects of site operations have been carefully thought out prior to initiation of any site tasks
- # To communicate to site employees the chemical and physical hazard potentials that exist at the site; how those hazards can impact their health and well-being; and the personal protection equipment and procedures required to minimize those hazards
- # To assure that all potential contingencies have been thoroughly examined in advance of injuries, illnesses, fires, or other catastrophic events

10.1 Elements

The SHASP and AHA will address, at minimum, the following:

- # *Names of key personnel and alternates responsible for the implementation and maintenance of the SHASP or AHA.* This section will describe these personnel and the lines of communication to be followed in performance of the project work.

- # *A health and safety risk analysis for each anticipated site task and operation. This will include a discussion of the materials thought to be on site, their health and safety hazard potentials, etc. Also to be included in this section is a discussion concerning the types of equipment and physical hazards associated with the operation of equipment that will be required to perform the project work.*
- # *Site-specific health and safety training that will be provided to all employees participating in project work. This training will include, at a minimum, the requirements of the SHASP or AHA and will be provided by the designated site health and safety officer (SHSO).*
- # *Initial personal protective equipment requirements specified for each anticipated site task and operation. This equipment will be prescribed based on materials suspected as being on site and the activities associated with these materials.*
- # *Medical surveillance requirements, when different from this CSHASP. Additional medical surveillance will be prescribed by the occupational physician who oversees the medical surveillance program, when warranted.*
- # *The types and frequencies of both personal and environmental air quality sampling, defined by specific, anticipated site task and operation. Specifics as to types of equipment, sampling and analytical methodologies, and sampling equipment operation, calibration, and maintenance, will also be provided in this section.*
- # *Details as to site control measures. This will include site delineation (i.e., exclusion, contamination reduction, and support zones), procedures for site entry and exit, the use of a "buddy system" site communications, site-specific safe work practices, and the identification of the nearest medical assistance.*
- # *Site-specific equipment and personnel decontamination procedures.*
- # *Standard operating procedures that are specific to the site.*
- # *A contingency plan, to be implemented in the event of injury/illness, fires, etc.*
- # *Confined space entry procedures, as necessary.*
- # *Site excavation guidelines, where required. These will be shared and/or sloped as per Subpart P of 29 CFR Part 1926.*

The SHSO and/or the HSM are responsible for reviewing all SHASPs and AHAs for site-specific project work. This review is performed to ensure that health and safety hazard potentials have been considered for all anticipated project work. No work associated with hazardous waste sites will be performed until an acceptable SHASP or AHA has been submitted. This document is accepted upon signature by the SHSO or HSM. A copy of all SHASPs and AHAs amendments will be maintained in Appendix B of this CSHASP document.

10.2 Site-Specific Plans

A site-specific plan will be developed using a standard SHASP form (Form G) or Activity Hazard Analysis form (Form L) for activities associated with the Libby site.

The SHASP can be supplemented by Activity Hazard Analysis data sheets that outline health and safety concerns associated with particular, specific tasks (e.g., excavations, fall protection, confined space entry, etc.). These sheets may be obtained from the SHSO or HSM.

Section 11

Temperature Extremes

11.1 Introduction

A majority of project activities are performed in outdoor locations and, as such, employees occasionally perform these activities in elevated and depressed temperatures extremes. In light of this, it's important that all employees understand the signs and symptoms of potential injuries associated with working in temperature extremes.

11.2 Heat Stress

Heat stress occurs when the body's physiological processes fail to maintain a normal body temperature because of excessive heat. The body reacts to stress related to heat a number of different ways. The reactions range from mild, such as, fatigue, irritability, anxiety, and decreased concentration, to severe, such as death. Heat related disorders are generally classified into four basic categories: heat rash, heat cramps, heat exhaustion, and heat stroke. The descriptions, symptoms, and treatment for these diseases are described as follows.

Heat Rash

Description - Heat rash is caused by continuous exposure to heat and humid air and is generally aggravated by coarse clothing. This condition decreases the ability to tolerate heat. This condition is the mildest of heat related disorders.

Symptoms - Mild red rash that is generally more prominent in areas of the body in contact with personal protective equipment.

Treatment - Decrease the amount of time in personal protective equipment and use powder to help absorb moisture.

Heat Cramps

Description - Heat cramps are caused by perspiration that is not off-set with adequate fluid intake. This condition is the first sign of a situation that can lead to heat stroke.

Symptoms - Acute, painful spasms occurring in the voluntary muscles (e.g., abdomen and extremities).

Treatment - Remove victim to a cool area and loosen clothing. Have victim drink 1-2 cups of water immediately and every 20 minutes thereafter until the symptoms subside. Total water consumption should be 1-2 gallons per day. Consult with a physician.

Heat Exhaustion

Description - Heat exhaustion is a state of very definite weakness or exhaustion caused by the loss of fluids from the body. This condition is more severe than heat cramps.

Symptoms - Pale, clammy, moist skin with profuse perspiration and extreme weakness. Body temperature is generally normal and the pulse is weak and rapid. Breathing is shallow. The victim may show signs of dizziness and may vomit.

Treatment - Remove the victim to a cool, air conditioned atmosphere. Loosen clothing and require that the victim lay in a flat position with the feet slightly elevated. Have the victim drink 1-2 cups of water immediately and every 20 minutes until the symptoms subside. Seek medical attention, particularly in severe situations.

Heat Stroke

Description - Heat stroke is an acute and dangerous situation. It can happen in a very short time period. The victims temperature control system shuts down completely resulting in a rise in body core temperature to levels that can cause brain damage and can be fatal if not treated promptly and effectively.

Symptoms - Red, hot, dry skin, with no perspiring. Rapid respiration, high pulse rate, and extremely high body temperature are other symptoms.

Treatment - Cool the victim quickly. If the body temperature is not brought down fast, permanent brain damage or death can result. The victim should be soaked in cool water. Get medical attention as soon as possible.

11.2.1 Prevention Measures

There are a number of steps that can be taken to minimize and/or eliminate the potential for heat stress disorders when working in hot atmospheres. Some of these are as follows:

- # Acclimate employees to working conditions by slowly increasing workloads over extended periods of time. Do not begin site work activities with the most demanding physical expenditures.
- # Where possible, conduct strenuous activities during cooler portions of the day, such as, early morning or early evening.
- # Provide and encourage all employees to drink lots of tempered water during the course of the work shift and discourage the use of alcohol during nonworking hours. It's essential that fluids lost due to perspiration get replenished.
- # During hot periods, use administrative controls to limit exposure.
- # Provide cooling devises when appropriate. Mobile showers and/or hose down facilities, powered air purifying respirators, and ice vests have all proven effective in reducing heat stress potential.

11.2.2 Heat Stress Monitoring

For strenuous field activities that are part of ongoing site work activities in hot weather, the following procedures are used to monitor the body's physiological response to heat. These procedures are implemented when employees are required to wear impervious clothing in atmospheres exceeding 70°F.

- # Monitor Heart Rate (HR) - Heart rate should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The measurement at the beginning of the rest period should not exceed 110 beats/minute. If the heart rate is in excess, the next work period should be shortened by 33 percent, with the length of the rest period remaining the same. If the heart rate is still in excess at the beginning of the next rest period, the following work cycle should be shortened by 33 percent. This procedure continues until the rate is maintained below 110 beats/minute.
- # Monitor Body Temperature - Body temperature is measured orally or by ear with a clinical thermometer as early as possible in the resting period. Temperatures should not exceed 99.6°F. If it does, the next work period should be shortened by 33 percent. If the oral temperature at the end of the next work period still exceeds 99.6°F, the following work cycle is shortened by another 33 percent. This procedure continues until the body temperature is maintained below 99.6°F.

The Wet-Bulb Globe Temperature (WBGT) Index is a method of monitoring environmental factors that most nearly correlate to an individual's physiological response to heat. This method uses a black globe thermometer, a natural wet-bulb thermometer, and a dry-bulb thermometer. From measurements with these instruments, the WBGT can be calculated. The WBGT is then compared with work load categories with the result being the establishment of recommended work/rest regimens. Examples of permissible heat exposure threshold limit values are as follows.

**Examples of Permissible Heat Exposure Threshold Limit Values
(Values are given in EC and (EF) WBGT)**

Work-Rest Regimen	Work Load		
	Light	Moderate	Heavy
Continuous work	30.0 (86)	26.7 (80)	25.0 (77)
75% work - 25% rest, each hour	30.6 (87)	28.0 (82)	25.9 (78)
50% work - 50% rest, each hour	31.4 (89)	29.4 (85)	27.9 (82)
25% work - 75% rest, each hour	32.2 (90)	31.1 (88)	30.0 (86)

As workload increases, the heat stress impact on an unacclimatized worker is exacerbated. For unacclimatized workers performing a moderate level of work, the permissible heat exposure TLV should be reduced by approximately 2.5EC.

11.3 Cold Stress

Persons working outdoors in low temperatures, especially at or below freezing, are subject to cold stress disorders. Exposure to extreme cold for even a short period of time

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can cause severe injury to the body surfaces and/or profound cooling which can lead to death. Areas of the body that have high surface area-to-volume ratios, such as, fingers, toes, and ears, are the most susceptible.

There are basically two types cold disorders. They can be classified as localized, as is the case with frostbite, or generalized, as in hypothermia. The descriptions, symptoms, and treatment for these diseases are described as follows.

Hypothermia

Description - As the temperature of the body drops, the thermo-regulatory system attempts to increase the body's generation of heat. This regulation includes the constriction of surface blood vessels, to conserve energy, and the body's production of glucose, to increase the body's metabolic rate, i.e., to be used as fuel to generate heat.

Symptoms - Uncontrollable shivering with the sensation of cold. Slower heartbeat and a weaker pulse are also symptoms.

Treatment - Get individual to a warm environment.

Frostbite

Description - Frostbite is a condition in which the fluids around the cells of body tissues freezes. The condition results in damage to and loss of tissue. The most vulnerable parts of the body are the nose, cheeks, ears, fingers, and toes.

Symptoms - Affected areas become white and firm.

Treatment - Get the individual to a warm environment and rewarm the areas quickly. Keep affected areas covered and warm. Warm water can be used to thaw the areas.

11.3.1 Preventive Measures

There are a number of steps that can be taken to minimize/eliminate the potential for cold stress disorders when working in a cold environment. Some of these are as follows:

- # As with warm environments, individuals can achieve a certain degree of acclimation when working in cold environments. The body will undergo some changes that will increase the body's comfort and also reduce the risk to cold injury.
- # Working in cold environments causes significant water losses through the skin and the lungs as a result of the dryness of the air. Increased fluid intake is essential to prevent dehydration, which effects the flow of blood to the extremities and increases the risk of cold injury. Warm, sweet, caffeine-free, nonalcoholic drinks and soups should be readily available.
- # Do not allow skin to be continuously exposed to sub-zero temperatures.

11.3.2 Cold Stress Monitoring

Air temperature alone is not sufficient to judge the potential for cold-related disorders in a particular environment. Heat loss from convection, air movement at the surface of the skin, is probably the greatest and most deceptive factor in the loss of body heat. For this

reason, wind speeds as well as air temperatures need to be considered when evaluating a potential for cold stress disorders. The resultant windchill index and the potential danger to exposed individuals have been tabulated as shown in Table 11-1.

**Table 11-1
Windchill Index**

Wind Speed in mph	Actual Thermometer Reading (F)									
	50	40	30	20	10	0	-10	-20	-30	-40
	Equivalent Temperature									
Calm	50	40	30	20	10	0	-10	-20	-30	-40
5	48	37	27	16	6	-5	-15	-26	-36	-47
10	40	28	16	4	-9	-21	-33	-46	-58	-70
15	36	22	9	-5	-18	-36	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	30	16	0	-15	-29	-44	-59	-74	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
Over 40 mph (little added effect)	Little Danger (for properly clothed person)			Increasing Danger (Danger from freezing of exposed parts)				Great Danger (Danger from freezing of exposed parts)		

The human body senses "cold" as a result of both air temperature and wind velocity. Cooling of exposed flesh increases rapidly as the wind velocity goes up. Frostbite can occur at relatively mild temperatures if wind penetrated the body insulation. For example, when the actual air temperature of the wind is 4.4 C (40 F) and its velocity is 48 km/h (30 mph), the exposed skin would perceive this situation as a equivalent still air temperature of -11 C (13 F).

Figures

Appendix A

Forms

Appendix B

Activity Specific Health and Safety Plans

Appendix C

Health and Safety Protocols for Subcontractors

Appendix D

Health and Safety Audit Criteria

Appendix A Forms

Libby Site Injury/Illness Report

Information about Injured, Ill, or Involved Employee:

First Name: _____ Middle Initial: _____

Last Name: _____

SSN: _____ Sex: _____ Age: _____

Employee Number: _____

Employee Status: ☐ CDM Federal ☐ Subcontractor

Name of Subcontractor Firm: _____

Address and Phone No.: _____

Employment Category:	Length of Employment:	Time in Occupation:
<input type="checkbox"/> Regular Full time	<input type="checkbox"/> In training <input type="checkbox"/> 3-5 years	<input type="checkbox"/> In training <input type="checkbox"/> 3-5 years
<input type="checkbox"/> Regular Part time	<input type="checkbox"/> <6 months <input type="checkbox"/> 5-10 years	<input type="checkbox"/> <6 months <input type="checkbox"/> 5-10 years
<input type="checkbox"/> Temporary	<input type="checkbox"/> 6 mos-1 yr <input type="checkbox"/> 10-20 years	<input type="checkbox"/> 6 mo-1 yr <input type="checkbox"/> 10-20 years
<input type="checkbox"/> Non-employee	<input type="checkbox"/> 1-3 years <input type="checkbox"/> 20+ years	<input type="checkbox"/> 1-3 years <input type="checkbox"/> 20+ years

Information about Accident/Injury/Illness:

Date of Accident: _____ Time: _____

Specific Location of Accident: _____

Witness(es) to the Accident/Injury: _____

Employee's Usual Occupation: _____

Occupation at Time of Accident: _____

Supervisor: _____

Injury or Illness?	<input type="checkbox"/> Injury	<input type="checkbox"/> Illness
Property Damage?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Vehicle Involved?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Injury/Illness Severity:

- ☐ First Aid Only
☐ Medical Treatment
☐ Lost Workdays - Restricted Activity
☐ Lost Workdays - Away from Work
☐ Fatality Date: _____
☐ Total Number of Lost Days: _____

OSHA Illness Code:

- ☐ Occupational Skin Diseases or Disorders
☐ Dust Diseases of the Lungs
☐ Respiratory Conditions Due to Toxic Agents
☐ Poisoning
☐ Disorders Due to Physical Agents
☐ Disorders Associated with Repeated Trauma
☐ All other Occupational Illnesses

Phase of Employee's Workday at Time of Injury:

- ☐ Performing Work Duties ☐ During Meals ☐ During Rest Period
☐ Entering or Leaving Workplace ☐ Other _____

General Type of Task Being Performed at Time of Injury/Illness: _____

Specific Activity Being Performed at Time of Injury/Illness: _____

Employee Was Working:

- ☐ Alone ☐ With a Crew or Fellow Worker ☐ Other Crew size: _____

Supervision at Time of Accident:

- ☐ Directly Supervised ☐ Indirectly Supervised ☐ Not Supervised ☐ Supervision Not Feasible

Name, Address, and Phone Number of Attending Physician: _____

Name and Address of Hospital: _____

Body Part Affected (circle all that are applicable):

Abdomen	Ear	Head	Multiple	Thigh
Ankle	Elbow	Heart	Musc. Skel.	Toe
Arm	Eye	Hips	Neck	Wrist
Back	Face	Kidneys, Intest.	Nervous Sys.	Other _____
Brain	Finger	Knee	Scalp	Unknown
Chest	Foot	Leg	Shoulder	
Digestive	Hand	Lungs	Skull	

Injury Type (circle all that are applicable):

Amputation	Contusion	Elec. Shock	Heat Stroke	Poisoning
Asphyxia	Crush/Bruise	Fracture	Infect. Disease	Radiation
Burn/Chemical	Cut/Puncture	Freezing	Inflammation	Scratch
Burn/Heat	Dermatitis	Hearing Loss	Multiple	Sprain/Strain
Concussion	Dislocation	Hernia	Occ. Disease	Other _____
				Unknown

Injury Source (circle all that are applicable):

Air Pressure	Clothing	Heat	Noise	Soaps
Animals	Coal/Petroleum	Hoists	Paper	Silica
Animal Product	Cold	Infectious	Particles	Scrap/Debris
Body Motion	Drugs &	Agents	Plants	Steam
Boilers	Medicines	Ladders	Plastics	Textiles
Boxes/	Electricity	Liquids	Power Tools	Vehicles/
Containers	Fire/Smoke	Machines	Power Trans.	Forklifts
Buildings/	Food Products	Molten Metal	Apparatus	Wood
Structures	Furniture	Miner/Metallic	Pumps	Working Surfaces
Ceramics	Glass	Minerals/	Radiating	Other _____
Chemicals	Hand Tool	Nonmetallic	Substances	Unknown

Accident Type Code (circle all that are applicable):

Struck Against	Fall on Same	Rub/Abrasion	Temp. Extremes	Motor Vehicle
Struck By	Level	Bodily Reaction	Radiations/	Other _____
Fall From	Caught In/	Overexertion	Caustics	Unknown
Elevation	Between	Electrocution	Public Transport	

Hazardous Conditions (circle all that are applicable):

Defects in Dress/Apparel	Inadequately	Placement Hazards	Other _____
Environmental Hazards	Guarded Work	Public Hazards	Unknown
Hazardous Procedures	Environment	None	

Accident Part Code (circle all that are applicable):

Parts of Boilers	Parts of Conveyors	Hand Tools	Parts of Vehicles	None
Parts of Buildings	Parts of Hoists	Power Tools	Machines	
Other _____				

Description of Accident: _____

Possible Causes of Accident/Injury/Illness:

Place a check in the box of each factor that applies to this incident.

EQUIPMENT - Was a Hazardous Condition a Contributing Factor?

- 9 Defect in Equipment/Tools
- 9 Hazardous Condition Not Recognized
- 9 Hazardous Condition Not Reported
- 9 Employee Not Informed/Job Procedure Not Specified
- 9 No Equipment Inspection Procedure
- 9 Inspection Procedure Failed to Detect Hazard
- 9 Correct Equipment/Tools Not Used
- 9 Correct Equipment Not Available
- 9 Employee Not Informed of Correct Equipment
- 9 Substitute Equipment
- 9 Equipment Design Contributed to Operator Stress/Error
- 9 Design/Quality of Tool Contributed to Hazardous Condition
- 9 Other/Unknown _____

ENVIRONMENT - Was the Location/Position of Equipment, Materials, or Employee a Contributing Factor?

- 9 Location/Position Contributed to a Hazardous Condition
- 9 Hazardous Condition Not Recognized
- 9 Hazardous Condition Not Reported
- 9 Employee Not Informed of Correct Job Procedure for Hazard
- 9 Employee Did Not Belong in the Area
- 9 Hazardous Condition Not Visible to Employee
- 9 Insufficient Workspace
- 9 Poor Environmental Control
- 9 Uncontrolled Release of Hazardous Material
- 9 Other/Unknown _____

PEOPLE - Was the Job Procedure(s) a Contributing Factor?

- 9 Aggravation of a Pre-existing Condition
- 9 No Written/Known Procedure
- 9 Job Procedure Inadequate
- 9 Employee Not Trained on Proper Job Procedure
- 9 Employee Deviated from Proper Job Procedure
- 9 Employee Not Physically/Mentally Capable of Performing Job
- 9 Job Procedure Too Difficult
- 9 Job Procedure Encourages Deviation
- 9 Other/Unknown _____

PERSONAL PROTECTIVE EQUIPMENT

- 9 Employee not using PPE
- 9 PPE Not Specified for Task
- 9 PPE Unavailable
- 9 Employee Not Advised of PPE
- 9 Employee Not Properly Trained in PPE
- 9 PPE Used Incorrectly
- 9 PPE Inadequate
- 9 Emergency Equipment Not Specified (Shower, Eyewash, Etc)
- 9 Emergency Equipment Not Available
- 9 Emergency Equipment Not Used
- 9 Emergency Equipment Malfunctioned
- 9 Other/Unknown _____

MANAGEMENT - Was a Management Defect a Contributing Factor?

- 9 Supervisor Failed to Detect/Anticipate/Report Hazardous Condition
- 9 Supervisor Failed to Detect/Correct Deviations from Job Procedure
- 9 No Supervisor Review of Hazards and Job Procedures
- 9 Supervisor Responsibility Not Defined/Understood
- 9 Supervisor Not Trained in Accident Prevention
- 9 Failure to Initiate Corrective Action for Known Hazard
- 9 Other/Unknown _____

OCCUPATIONAL HEALTH - Was a Chemical or Physical Agent a Contributing Factor?

Physical Agent:

- 9 Noise, Vibration
- 9 Temperature Extremes
- 9 Ionizing Radiation - X, Gamma, Beta, or Alpha Radiation
- 9 Non-ionizing Radiation - Microwave, Laser, Ultraviolet, or Radio Frequency
- 9 Ergonomic - Repetitive Motion Trauma, Inappropriate Lighting, Glare, Incorrect or Insufficient Tooling, Benches, Seating

Chemical Agent:

- 9 Solvents Solvent Name _____
- 9 Acid, Bases Acid or Base Name _____
- 9 Particulates Particulate Name _____
- 9 Other Toxic Chemicals Chemical Name _____

Biological Agent:

- 9 Microorganism Microorganism _____
- 9 Insect Insect's Name _____
- 9 Animal Animal Species _____
- 9 Allergens Allergen Name _____

CORRECTIVE ACTION REQUIRED: _____

Signatures:

Immediate Supervisor _____ Date _____

H&S Coordinator _____ Date _____

Performance Center Mgr. _____ Date _____

Corp. H&S Director _____ Date _____

For Office Use Only:

Case No.s of Others Injured, Ill, or Involved in the Same Accident:

Case No.:	OSHA Recordable? 9 Yes 9 No
Region:	Address:
Project No.:	Accident or Diagnosis Date:

Photos Relating to Accident/Injury

(Make copies of this page as necessary.)

Insert photos here.

(Make copies of this page as necessary.)

Employer: _____

Position/Craft: _____

Phone: _____

This statement is in reference to: _____

Site of accident (job name, location): _____

Date of accident: _____

Describe what you know about the accident, what you saw or heard, what you were doing before the accident, what you did after the accident (Use additional pages as necessary):

1. *Introduction*

2. *Background*

3. *Methodology*

4. *Results*

5. *Discussion*

6. *Conclusion*

7. *References*

8. *Appendix*

9. *Index*

10. *Glossary*

11. *Notes*

12. *Footnotes*

13. *Endnotes*

14. *Supplementary Material*

15. *Tables*

16. *Figures*

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27

This statement is true to the best of my knowledge and memory.

Date _____

Libby Site
EMPLOYEE MEETING RECORD

Project # or office location: _____

Instructor: _____

Duration of training: _____

Topics discussed: _____

[illegible]

Libby Site Site-Specific Training Record

Presenter: _____

Date: _____

Job Number: _____

Location: _____

Training Topic: _____

Employee Name:

Employee Signature

Employee ID Number

Libby Site Hot Work Permit

Project Name: _____

Project Number: _____

Date Written: _____

Date of Expiration: _____

NOTE: Read instructions on reverse side before completing this permit.

Type of Hot Work:

☐ Internal Combustion Engines

☐ Hot Tapping

☐ Sparking

☐ Work on Live Equipment

☐ Welding/Burning

☐ Other

Scope of Work: _____

What equipment preparation is required? (i.e., lockout/tagout, blinding pipes) _____

Is any area clean-up required? _____ Explain: _____

Is work area ventilation required? _____ What Type? _____

Is fire equipment required? _____ What Type? _____

What methods are to be employed to control sparks? _____

What type of firewatch is required, if any? _____

What periodic air/gas testing is required? _____

What continuous air/gas testing is required? _____

What instruments are required? _____

Where should the continuous air monitor(s) be placed? _____

What PPE is required? _____

Who must be notified each time work commences? _____

Special Instructions: _____

Signatures:

Site Supervisor _____

Site Safety Officer _____

Client Representative (if required) _____

Hot Work will occur by permit only and is considered to be any of the following:

1. Use of Internal Combustion Engines (gasoline or diesel).
2. Use of Powered Tools that produce sparks in drilling, grinding, chipping, etc.
3. Any high temperature work such as welding, burning, soldering, stress relieving, and use of open flames.
4. Work on live equipment (requires supplemental documentation - see supervisor) involving any high temperature work done on equipment still in operation or known to contain flammable material.
5. Hot Tap (requires supplemental documentation - see supervisor) involving cutting into a piece of equipment known to contain flammable material.

A written permit, prepared and signed by authorized individuals, must be issued prior to any hot work in any area not specifically designated as a "free burning area".

Abbreviated Areas

The site Project Manager or his designee will arrange via the Hot Work Permit to:

1. Ensure the work is necessary and can be done safely.
2. Determine the period in which the permit is valid.
3. Specify which type(s) of hot work is approved.
4. Describe exact work to be done and by whom.
5. Prepare equipment and/or area for work. Verify all requirements have been satisfied before issuing the permit.
6. Isolate equipment when required.
7. Clear area of combustible/flammable material (50 ft. radius, minimum).
8. Specify fire protection and equipment necessary for the work.
9. Specify if additional methods or equipment is necessary to control sparks (fire blanket, water sprays, etc.)
10. Specify duties of the firewatch, if firewatch is mandated.
11. Specify and perform types of air/gas tests that are required initially, continually and/or periodically. At a minimum, tests shall be performed for explosive gases and oxygen levels. If levels of combustible gases exceed 20 percent of the LEL or if levels of oxygen exceed 25 percent, work shall stop immediately.
12. Determine number and placement of continuous air/gas monitors where necessary.
13. Identify the authorized person to approve hot work start-up.
14. Secure appropriate signatures.
15. Distribute, post, and file necessary copies of the permit and gas test results.

Refer to the CDM Federal Health and Safety Manual and 29 CFR 1926.350-354 for complete procedures.

Libby Site Trench/Excavation Permit

Contractor(s): _____ Date work will start: _____

Competent person: _____ Date work will end: _____

Specific location and description of work: _____

Sketch of location attached? ☐ Yes ☐ No

Size of trench or excavation: _____ Depth _____ Length _____ Width _____

Soil type: ☐ Type A ☐ Type B ☐ Type C ☐ Solid Bedrock

Lines in vicinity of work:

☐ Electrical ☐ Steam ☐ Telephone ☐ Water ☐ Sewer ☐ Alarm

☐ Drain ☐ Process ☐ Other: _____

Other known obstructions:

☐ Footings ☐ Pilings ☐ Concrete Encasements ☐ Other: _____

Precautions to be taken:

☐ Ground Tools ☐ Hand Excavate ☐ Insulate Operator ☐ De-energize lines

Protective System:

☐ Sloping ☐ Shoring ☐ Benching

The above data has been checked with blueprint data on file. When close clearances are indicated hand excavation must be used to determine the exact location. Existing lines and interference in the vicinity of work must be marked.

Contractor's Signature

CDM Federal Signature

Libby Site Confined Space Entry Permit

Date: _____

Permit Number: _____ Permit Expiration Date/Time: _____

District/Location: _____ Department: _____

Confined Space to be Entered: _____

Description of Work to be Performed: _____

NATURE OF HAZARDS IN CONFINED SPACE: (check)

- ☐ Oxygen deficiency (less than 19.5% at sea level)
- ☐ Flammable gases or vapors (greater than 10% of the lower flammable limit or greater than 23.5% oxygen at sea level)
- ☐ Toxic gases or vapors (greater than the permissible exposure limit)
- ☐ Mechanical hazards
- ☐ Electrical shock
- ☐ Materials harmful to the skin
- ☐ Engulfment
- ☐ Other _____

PRE-ENTRY PREPARATION: (check)

- ☐ Notify affected departments of service interruption
- ☐ Isolate - blanked or double valve, with lock and tag
- ☐ Energy sources neutralized
- ☐ Cleaned, drained, washed, and purged
- ☐ Ventilation to provide fresh air
- ☐ Emergency response team available
- ☐ Employees informed of specific confined space hazards
- ☐ Operating and rescue procedures reviewed and available to each employee
- ☐ Atmospheric Test in compliance
- ☐ Attach hot work permit
- ☐ Other _____

EQUIPMENT REQUIRED FOR ENTRY AND WORK: (check)

- ☐ Respirator
- ☐ Lifeline and safety harness
- ☐ Protective clothing
- ☐ Hearing protection
- ☐ Other _____
- Electrical Equipment/Tools
 - ☐ Low voltage
 - ☐ Ground-fault current interrupters
 - ☐ Approved for hazardous locations
- Respiratory protection (specify) _____
- Communication aid (specify) _____
- Rescue equipment (specify) _____

AUTHORIZED ENTRANTS:

AUTHORIZED ATTENDANTS:

PROBLEMS ENCOUNTERED:

ATMOSPHERIC MONITORING:

Test	Acceptable Limit	Check if Required	Results	Results	Results	Results	Results	Results
			Time:	Time:	Time:	Time:	Time:	Time:
Oxygen - min.	19.5%							
Oxygen - max.	22.0%							
Flammability	10% LEL							
H ₂ S	10 ppm							
Toxic:								
SO ₂	0.2 ppm							
Heat								
Other:								
Other:								

Name of employee conducting atmospheric monitoring: _____

ENTRY SUPERVISOR AUTHORIZATION:

I certify that all required precautions have been taken and necessary equipment is provided for safe entry and work in this confined space.

Name: _____ Signature: _____ Date: _____ Time: _____

Reviewer Name (print): _____ Reviewer Signature: _____

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

PROJECT DOCUMENT NO.:

PROJECT NAME	WORK ASSIGNMENT NO.	REGION
JOB SITE ADDRESS	CLIENT	
	PROJECT NO.	
SITE CONTACT	CLIENT CONTACT	
PHONE NO.	PHONE NO.	
() AMENDMENT NO. TO EXISTING APPROVED HSP - DATE EXISTING APPROVED HSP		

OBJECTIVES OF FIELD WORK:

TYPE: Check as many as applicable

- | | | |
|---|---------------------------------------|---|
| <input type="checkbox"/> Active | <input type="checkbox"/> Landfill | <input type="checkbox"/> Unknown |
| <input type="checkbox"/> Inactive | <input type="checkbox"/> Uncontrolled | <input type="checkbox"/> Military |
| <input type="checkbox"/> Secure | <input type="checkbox"/> Industrial | <input type="checkbox"/> Other specify: |
| <input type="checkbox"/> Unsecure | <input type="checkbox"/> Recovery | |
| <input type="checkbox"/> Enclosed space <input type="checkbox"/> Well Field | | |

DESCRIPTION AND FEATURES: Summarize below. Include principal operations and unusual features (containers, buildings, dykes, power lines, hills, slopes, river)

SURROUNDING POPULATION: ☐ Residential ☐ Industrial ☐ Rural ☐ Urban ☐ OTHER: Page 1 of

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

THIS PAGE RESERVED FOR MAP (Show Exclusion, Contamination Reduction, and Support Zones. Indicate evacuation and reassembly points.)

Page 2 of

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

HISTORY: Summarize below. In addition to history, include complaints from public, previous agency actions, known exposures or injuries, etc.

WASTE TYPES: ☐ Liquid ☐ Solid ☐ Sludge ☐ Gas ☐ Unknown ☐ Other specify:

WASTE CHARACTERISTICS: Check as many as applicable.

☐ Corrosive ☐ Flammable ☐ Radioactive

☐ Toxic ☐ Volatile ☐ Reactive

☐ Inert Gas ☐ Unknown ☐ Other specify:

WORK ZONES: Describe the Exclusion, Contamination Reduction, and Support Zones in terms onsite personnel will recognize.

HAZARDS OF CONCERN:

☐ Heat Stress attach guidelines ☐ Noise

☐ Cold Stress attach guidelines ☐ Inorganic Chemicals

☐ Explosive/Flammable ☐ Organic Chemicals

☐ Oxygen Deficient ☐ Motorized Traffic

☐ Radiological ☐ Heavy Machinery

☐ Biological ☐ Slips, Trips & Falls

☐ Other specify:

PRINCIPAL DISPOSAL METHODS AND PRACTICES: Summarize below:

Page 3 of

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

HAZARDOUS MATERIAL SUMMARY: Circle waste type and estimate amounts by category

CHEMICALS Amounts/Units:	SOLIDS Amounts/Units:	SLUDGES Amounts/Units:	SOLVENTS Amounts/Units:	OILS Amounts/Units:	OTHER Amounts/Units:
Acids	Flyash	Paint	Halogenated (chloro, bromo) Solvents	Oily Wastes	Laboratory
Pickling Liquors	Asbestos	Pigments	Hydrocarbons	Gasoline	Pharmaceutical
Caustics	Milling/Mine Tailings	Metal Sludges	Alcohols	Diesel Oil	Hospital
Pesticides	Ferrous Smelter	POTW Sludge	Ketones	Lubricants	Radiological
Dyes/Inks	Non-ferrous Smelter	Aluminum	Esters	PCBs	Municipal
Cyanides	Metals	Distillation Bottoms	Ethers	Polynuclear Aromatics	Construction
Phenols	Other	Other	Other	Other	Munitions
Halogens	Specify:	Specify:	Specify:	Specify:	Other
Dioxins					Specify:
Other					
Specify:					

OVERALL HAZARD EVALUATION: () High () Medium () Low () Unknown (Where tasks have different hazards, evaluate each. Attach additional sheets if necessary)

JUSTIFICATION:

FIRE/EXPLOSION POTENTIAL: () High () Medium () Low () Unknown

BACKGROUND REVIEW: () COMPLETE () INCOMPLETE

Page 4 of

LIBBY SITE

CDM Federal Health and Safety Program

NA=Not Available	NE=None Established	U=Unknown			
S=Soil	SW=Surface Water	T=Tailings	W=Waste	TK=Tanks	SD=Sediment
A=Air	GW=Groundwater	SL=Sludge	D=Drums	L=Lagoon	OFF=Offsite

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

FIELD ACTIVITIES COVERED UNDER THIS PLAN

TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION(Attach additional sheets as necessary)	Type	Primary	Contingency	HAZARD		
				SCHEDULE		
1	Intrusive	A B C D	A B C D	Hi	Med	Low
	Non-intrusive	Modified	Exit Area			
2	Intrusive	A B C D	A B C D	Hi	Med	Low
	Non-intrusive	Modified	Exit Area			
3	Intrusive	A B C D	A B C D	Hi	Med	Low
	Non-intrusive	Modified	Exit Area			
4	Intrusive	A B C D	A B C D	Hi	Med	Low
	Non-intrusive	Modified	Exit Area			
5	Intrusive	A B C D	A B C D	Hi	Med	Low
	Non-intrusive	Modified	Exit Area			
6	Intrusive	A B C D	A B C D	Hi	Med	Low
	Non-intrusive	Modified	Exit Area			

PERSONNEL* AND RESPONSIBILITIES (Include subcontractors)

NAME	FIRM/REGION	CDM Federal HEALTH CLEARANCE	RESPONSIBILITIES	ONSITE?
			WORK ASSIGNMENT MGR.	1 - 2 - 3 - 4
			SITE HEALTH & SAFETY COORDINATOR	1 - 2 - 3 - 4
			ALTERNATE SITE H&S COORDINATOR	1 - 2 - 3 - 4
			STAFF	1 - 2 - 3 - 4
				1 - 2 - 3 - 4
				1 - 2 - 3 - 4
				1 - 2 - 3 - 4

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

PROTECTIVE EQUIPMENT: Specify by task. Indicate type and/or material as necessary. Use copies of this sheet if needed.

BLOCK A TASKS: 1 - 2 - 3 - 4 - 5 - 6
LEVEL: A - B - C - D - Modified
() Primary
() Contingency

Respiratory: () Not Needed
() SCBA, Airline:
() APR:
() Cartridge:
() Escape Mask:
() Other:
Prot. Clothing: () Not Needed
() Encapsulated Suit:
() Splash Suit:
() Apron:
() Tyvek Coverall:
() Saranex Coverall:
() Cloth Coverall:
() Other:
Head and Eye: () Not Needed
() Safety Glasses:
() Face Shield:
() Goggles:
() Hard Hat:
() Other:
Gloves: () Not Needed
() Undergloves:
() Gloves:
() Overgloves:
Boots: () Not Needed
() Boots: Leather steel-toed work boots
() Overboots:
() Rubber:
() Other - specify below:

BLOCK B TASKS: 1 - 2 - 3 - 4 - 5 - 6
LEVEL: A - B - C - D - Modified
() Primary
() Contingency

Respiratory: () Not Needed
() SCBA, Airline:
() APR:
() Cartridge:
() Escape Mask:
() Other:
Prot. Clothing: () Not Needed
() Encapsulated Suit:
() Splash Suit:
() Apron:
() Tyvek Coverall:
() Saranex Coverall:
() Cloth Coverall:
() Other:
Head and Eye: () Not Needed
() Safety Glasses:
() Face Shield:
() Goggles:
() Hard Hat:
() Other:
Gloves: () Not Needed
() Undergloves:
() Gloves:
() Overgloves:
Boots: () Not Needed
() Boots: Leather steel-toed work boots
() Overboots:
() Rubber:
() Other - specify below:

BLOCK C TASKS: 1 - 2 - 3 - 4 - 5 - 6
LEVEL: A - B - C - D - Modified
() Primary
() Contingency

Respiratory: () Not Needed
() SCBA, Airline:
() APR:
() Cartridge:
() Escape Mask:
() Other:
Prot. Clothing: () Not Needed
() Encapsulated Suit:
() Splash Suit:
() Apron:
() Tyvek Coverall:
() Saranex Coverall:
() Cloth Coverall:
() Other:
Head and Eye: () Not Needed
() Safety Glasses:
() Face Shield:
() Goggles:
() Hard Hat:
() Other:
Gloves: () Not Needed
() Undergloves:
() Gloves:
() Overgloves:
Boots: () Not Needed
() Boots: Leather steel-toed work boots
() Overboots:
() Rubber:
() Other - specify below:

BLOCK D TASKS: 1 - 2 - 3 - 4 - 5 - 6
LEVEL: A - B - C - D - Modified
() Primary
() Contingency

Respiratory: () Not Needed
() SCBA, Airline:
() APR:
() Cartridge:
() Escape Mask:
() Other:
Prot. Clothing: () Not Needed
() Encapsulated Suit:
() Splash Suit:
() Apron:
() Tyvek Coverall:
() Saranex Coverall:
() Cloth Coverall:
() Other:
Head and Eye: () Not Needed
() Safety Glasses:
() Face Shield:
() Goggles:
() Hard Hat:
() Other:
Gloves: () Not Needed
() Undergloves:
() Gloves:
() Overgloves:
Boots: () Not Needed
() Boots: Leather steel-toed work boots
() Overboots:
() Rubber:
() Other - specify below:

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

MONITORING EQUIPMENT: Specify by task. Indicate type as necessary. Attach additional sheets as necessary.

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS (Includes schedules of use)
Combustible Gas Indicator	1 - 2 - 3 - 4 - 5 - 6	0-10% LEL 10-25% LEL >25% LEL	No explosion hazard Potential explosion hazard; notify SHSC. Explosion hazard; interrupt task/evacuate	() Not Needed
		21.0% O ₂ <21.0% O ₂ <19.5% O ₂	Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	
Radiation Survey Meter	1 - 2 - 3 - 4 - 5 - 6	3X Background >2mR/hr	Notify SHSC Interrupt task/evacuate	() Not Needed
Photoionization Detector Type _____ () 11.7 ev () 10.2 ev () 9.8 ev () ___ ev	1 - 2 - 3 - 4 - 5 - 6	Specify:		() Not Needed
Flame Ionization Detector Type _____	1 - 2 - 3 - 4 - 5 - 6	Specify:		() Not Needed
Detector Tubes/Monitox Type _____ Type _____	1 - 2 - 3 - 4 - 5 - 6	Specify:		() Not Needed
Respirable Dust Monitor Type _____ Type _____	1 - 2 - 3 - 4 - 5 - 6	Specify:		() Not Needed
Other Specify _____	1 - 2 - 3 - 4 - 5 - 6	Specify:		

HEALTH AND SAFETY PLAN FORM**LIBBY SITE**

CDM Federal Health and Safety Program

DECONTAMINATION PROCEDURES**ATTACH SITE MAP INDICATING EXCLUSION, DECONTAMINATION, AND SUPPORT ZONES AS PAGE TWO****Personalized Decontamination**

Summarize below and/or attach diagram; discuss use of work zones.

☐ Not Needed**Sampling Equipment Decontamination**

Summarize below and/or attach diagram; discuss use of work zones.

☐ Not Needed**Heavy Equipment Decontamination**

Summarize below and/or attach diagram; discuss use of work zones.

☐ Not Needed**Containment and Disposal Method****Containment and Disposal Method****Containment and Disposal Method**

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

EMERGENCY CONTACTS			EMERGENCY CONTACTS	NAME	PHONE
Water Supply			Health and Safety Manager	Chuck Myers	1-703-968-0900
Site Telephone			Project Manager	Philip C. Dula	1-913-492-8181
EPA Release Report No.	1-800-424-8802		Health & Safety Coordinator	Jeff J. Weatherly	1-913-492-8181
			Client Contact		
Facility Management			Other (specify)		
Other (specify)	Chuck Myers (home) (703) 754-0700		Environmental Agency		
			State Spill Number		
CONTINGENCY PLANS Summarize below:			Fire Department		
			Police Department		
			State Police		
			Health Department		
			Poison Control Center		
			Occupational Physician	Dr. Edward Barnes	1-800-229-3674
			MEDICAL EMERGENCY		
HEALTH AND SAFETY PLAN APPROVALS			Hospital Name:		Phone:
Prepared by:			Hospital Address:		
SHSC Signature:			Name of Contact at Hospital:		
HSM Signature:			Name of 24-Hour Ambulance:		Phone:
			Route to Hospital (Attach map with route to hospital)		
			Distance to Hospital:		

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

THIS PAGE RESERVED FOR HOSPITAL ROUTE MAP

Page 11 of

HEALTH AND SAFETY PLAN FORM

LIBBY SITE

CDM Federal Health and Safety Program

The following personnel have read and fully understand the contents of this Health and Safety Plan and further agree to all requirements contained herein.

Name

Affiliation

Date

Signature

Libby Site Medical Authorization Form

Employee: _____

Type of Exam: _____ Date of Exam: _____

The individual identified above has completed a medical surveillance examination. Review of the data from this examination resulted in the following conclusions:

Medical and Safety Restrictions

Medical and Safety Recommendations

Appraisal of Lifting Capacity

Clearance for Work with Hazardous Materials

In compliance with 29 CFR 1910.120 (f), medical clearance 9 is 9 is not issued for individual to work with hazardous materials.

Use of Respiratory Equipment

In compliance with 29 CFR 1910.134, medical clearance 9 is 9 is not issued for unrestricted use of respiratory protective equipment.

Exposure to Temperature Extremes

Exposures to temperature extremes 9 are 9 are not acceptable providing that reasonable precautions are taken.

Physician's Signature: _____ Date: _____

Libby Site Request for Medical Records

This document authorizes CDM Federal to obtain copies of my medical records from:

Physician Name: _____

Address: _____

City: _____

State, Zip: _____

I understand that no X-rays will be sent as part of this record. I also understand that there is no charge for this service and the records requested will be mailed within 15 days of receipt of this request.

(Please Print)

Employee Name: _____

Social Security No.: _____

Employee Number: _____

Division/Office: _____

Signature: _____

Date: _____

Employee Signature Authorizes Release

Libby Site Respirator Training Documentation Form

Employee Name: _____ Division/Office: _____

Your signature on this Respirator Training Record will attest to your having received and understood the basic respirator training program which both CDM Federal and the Occupational Safety and Health Administration (OSHA) require as a part of their Respiratory Protection Standard.

The basic respirator training program consists of the following items:

- # An explanation of the problems involved with misuse of the respirator
- # A discussion of why this engineering control could not be used effectively and, as a result, why respiratory protection is required
- # How and why this particular respirator was chosen for this specific job
- # The limitations of the respirator selected
- # How to put on the respirator and adjust the facepiece and tension straps properly
- # The essential points of the care and maintenance program
- # How to recognize and handle emergencies
- # How to inspect the respirator
- # When to use an air purifying respirator
- # When a supplied-air respirator is required
- # The purpose of the medical evaluation
- # A Powered Air Purifying Respirator (PAPR) is available to you upon request, as long as it meets the protection factor for the hazard involved

Signature: _____ Date: _____

Respirator Test Summary

Name: _____ Division/Office: _____

Date of Testing: _____ Test Conducted By: _____

Respirator Selected: Manufacturer: _____

Model: _____

Respirator Size: _____ MSHA/NIOSH Approval No.: _____

Type(s) of Test Conducted: _____
(Irritant Smoke, Isoamyl Acetate, etc.)

Testing Agent(s) Used: _____

Signature of Person Conducting Test: _____

Libby Site Project Safety Audit

Project: _____ Date: _____

Location: _____ Job Number: _____

Survey Conducted By: _____ Title: _____

		In Compliance	Compliance	N/A	
<i>Standard</i>	<i>Title</i>	<i>T</i>	<i>T</i>	<i>T</i>	<i>Corrective Action Taken and Date</i>
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.				
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.				
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.				
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.				
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toeboards shall be installed.				
1926.100 (a)	Head protection, where there is a possible danger of head injury.				

		In Compliance	Compliance	N/A	
<i>Standard</i>	<i>Title</i>	<i>T</i>	<i>T</i>	<i>T</i>	<i>Corrective Action Taken and Date</i>
1926.652 (a) (1)	Excavation protective systems; examination by competent person when less than 5 feet in depth.				
1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.				
1926.20 (b) (1)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.				
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toeboards.				
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.				
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.				
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.				
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.				
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.				
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, is used in accordance with the listing, labeling or certification.				

		In Compliance	Compliance	N/A	
<i>Standard</i>	<i>Title</i>	<i>T</i>	<i>T</i>	<i>T</i>	<i>Corrective Action Taken and Date</i>
1926.451 (a) (4)	Scaffolding shall have guardrails and toeboards when more than 10 feet high and when less than 45 inches of work space.				
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.				
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.				
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.				
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.				
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.				
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.				
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.				
1926.102 (a) (1)	Eye and face protection shall be provided.				
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.				
1926.350 (a) (9)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a ½ fire resistance barrier.				

		In Compliance	Compliance	N/A	
Standard	Title	T	T	T	Corrective Action Taken and Date
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.				
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.				
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/ belts, temporary floors, scaffolds, catch platform are not practical.				
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.				
1926.451 (a) (2)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.				
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.				
1926.404 (f) (7)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer of the tool is double insulated.				
1926.556 (b) (2)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.				
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.				

		In Compliance	Compliance	N/A	
<i>Standard</i>	<i>Title</i>	<i>T</i>	<i>T</i>	<i>T</i>	<i>Corrective Action Taken and Date</i>
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.				
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.				
1926.451 (a) (3)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.				
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.				

Comments:

ACTIVITY HAZARD ANALYSIS

[1] AHA No.

Instructions for filling out AHA

Enter information on the AHA for as described below. Bracketed numbers refer to the numbered sections of the form.

- [1] Enter a unique identifying number for each AHA on every page.
- [2] Describe the work location.
- [3] Enter the task title.
- [4] Describe as many phases for completing the work as needed to clearly break down the steps, hazards and hazard controls. (See Example)
- [5] List the Craft or technical discipline for each work group needed to conduct each phase of the task.
- [6] List the steps needed to complete each phase of the task..
- [7] List the work group (craft or discipline) that will perform each step.
- [8] List the hazards involved with each step.
- [9] List the controls for each hazard in the following priority order:
 - 1.Engineered controls
 - 2.Operational work practices
 - 3.Administrative documents
 - 4.Personal Protective Equipment
 - 5.Special personal qualifications for workers
- [10] List documents that will be attached to the AHA for use in the field (e.g., RWP, LOTO, Hotwork Permits)
- [11] List reference documents that should be available on site but do not need to be in the supervisors hands to conduct job briefings or control work.
- [12] Site Environmental Safety and Health Representative and Site supervisor complete this section to agree that the work can be safely performed as described in the AHA.
- [13] Repeat steps 6 through 9 to describe any changes needed in the AHA based on changes in work or hazards encountered.
- [14] Site Environmental Safety and Health Representative and Site supervisor complete this section to agree that the work can be safely performed as described in the AHA change.

ACTIVITY HAZARD ANALYSIS

[1] AHA No.

[2] Work Location:

[3] Task Title:

[4] Work Phase:

[5] List Work Groups Needed for Each Phase

A.

A.

B.

B.

C.

C.

D.

D.

E.

E.

[6] Activity Steps

[7] Work Groups

[8] Hazards

[9] Hazard Controls (Engineered, Operational, Documents, PPE, Qualifications)

ACTIVITY HAZARD ANALYSIS

[1] AHA No.

[6] Activity Steps	[7] Work Groups	[8] Hazards	[9] Hazard Controls (Engineered, Operational, Documents, PPE, Qualifications)

ACTIVITY HAZARD ANALYSIS

[1] AHA No.

[6] Activity Steps	[7] Work Groups	[8] Hazards	[9] Hazard Controls (Engineered, Operational, Documents, PPE, Qualifications)

ACTIVITY HAZARD ANALYSIS

[1] AHA No.

[6] Activity Steps	[7] Work Groups	[8] Hazards	[9] Hazard Controls (Engineered, Operational, Documents, PPE, Qualifications)

ACTIVITY HAZARD ANALYSIS

[1] AHA No.

[10] Attachments:

Document Type	Document Number	Applies to Work Group	For Work Step(s)/Phase(s)
Comments:			

[11] References:

Document Type	Document Number	Applies to Work Group	For Work Step(s)/Phase(s)

[12] Subcontractor Approvals

		a. Print Name	b. Signature	c. Date
1	Environmental, Safety, and Health			
2	Site Supervisor			

ACTIVITY R. HAZARD ANALYSIS

[1] AHA No.

[13] Change Summary			
[6] Activity Steps	[7] Work Groups	[8] Hazards	[9] Hazard Controls (Engineered, Operational, Documents, PPE, Qualifications)

[14] Subcontractor Approvals		a. Print Name	b. Signature	c. Date
1	Environmental, Safety, and Health			
2	Site Supervisor			

PRE-JOB BRIEFING ATTENDANCE

7/31/98

Appendix B

Activity Specific Health and Safety Plans

Future amendments to be maintained in this Appendix B.

Appendix C

CDM Federal Health and Safety Protocol for Subcontractors

The Project Health and Safety Program is designed to coordinate the overall Health and Safety effort during construction. The Project Health and Safety Program does not relieve a contractor of his contract responsibilities for health and safety, or any applicable governmental regulations.

Contractors shall be responsible for the health and safety of all persons and property affected by their performance of the work, including work performed by their subcontractors. This requirement shall apply continuously during the entire contract period and shall not be limited just to normal working hours.

Contractors shall be responsible for the implementation of a written Health and Safety Program (Subcontractors' Safety Program) to prevent their employees from working under conditions that are unsanitary or dangerous to their health and safety. Contractors' conformance with the requirement to initiate and maintain such a program is mandatory under the provisions of their construction contract.

Contractors shall designate a qualified safety representative to be responsible for the administration of the Contractors' Safety Programs and the Project Health and Safety Program. Contractors shall also be responsible for the administration of the Contractors' Safety Programs and the Project Health and Safety Program for their subcontractors.

1.0 Program Requirements

The Contractors' Safety Program shall meet the minimum applicable requirements of the Occupational Health and Safety Act of 1970 as amended. The following additional requirements are a mandatory part of each contractor's Safety Program to meet the minimum requirements of the Project Health and Safety Program:

- Deliver one copy of the contractor's Safety Program to CDM Federal for review.
- Submit to CDM Federal, as part of the Safety Program, a Designation of Competent Person form that designates a competent person for each area listed that is applicable to their work. OSHA defines a competent person as, "One who, through training and experience, is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them." Contractors' competent persons shall be the competent person for each subcontractor unless otherwise indicated.
- Participation in the weekly Toolbox Safety Meetings.

- Cooperation with CDM Federal, federal, state, and local agencies concerning health and safety and property damage matters as they concern.
- Participation in the implementation of fire control measures as may be appropriate for the protection of individuals and property.
- Provide training and education, and the documentation thereof, to the contractor's employees in the recognition, avoidance, and prevention of unsafe working conditions and unsafe work practices and emergency procedures.
- Maintain accurate health and safety records and statistics, as required, and making available such records to CDM Federal upon request, for their periodic review.
- A system to ensure that reports required by the Project Health and Safety Program are submitted to CDM Federal in a timely manner.
- Conduct daily work area health and safety inspections with written reports submitted weekly to CDM Federal. Included in the reports shall be deficiencies detected and corrective action taken.
- A system for immediately reporting all injuries, accidents, illnesses, fires, hazardous material spills, and unsafe conditions and procedures to the contractor's safety representative or designee.
- Systems of weekly Toolbox Safety Meetings are to be held and documented for all contractors' employees. A copy of the Weekly Safety Meeting Report must be submitted to CDM Federal. Weekly toolbox report forms can be obtained from CDM Federal.
- Provide a system to prevent the use of unsafe or defective equipment, tools, materials, or machinery, which includes procedures for tagging and/or lockout to render such unsafe items inoperable.
- Provide a system to ensure that only employees who are qualified by training or experience are allowed to operate equipment, tools, and machinery.
- Provide appropriate first aid/medical coverage for all of its employees and provide CDM Federal with weekly first aid logs.
- Develop, document, and implement evacuation/emergency plans.
- Adhere to CDM Federal's Activity Hazard Analysis (AHA) Policy.

- Designate a qualified representative to be responsible for rigging and heavy lifting. A report must be submitted to, and approved by, CDM Federal prior to any lifts over 20 tons. The following items shall be included in the report:
 - Make and model number of cranes or hoist
 - Lift radius, boom angle, and boom length, if applicable
 - Lifting capacity of crane or hoist for the particular configuration
 - Size and capacity of all rigging
 - Weight of object being lifted and associated rigging
 - Diagram of lift layout

Documented programs related to health and safety that are required by contractors include:

- Hazard Communication Program for the protection of employees who are required to handle or use flammable liquids, gases, toxic materials, poisons, caustics, and other harmful substances. The objectives of the program will be to create an employee awareness of potential hazards of such substances, the recommended personal hygiene for those exposed to those hazards, the personal protective measures and devices required, and the emergency notification procedures to be used in the event of an accident.
- Confined Space Entry Program for employees who are required to enter confined or enclosed spaces. Instructions shall include the nature of the hazards involved, the necessary precautions to be taken, and the proper use of required protective and emergency equipment.
- Personnel Protective Equipment Program for employees who require the use of personal protective equipment because of the hazards of the work being performed.
- Equipment Inspection Guidelines. A program that provides for periodic documented inspections of all equipment in accordance with applicable federal, state, and local regulations.
- Lockout/Tagout Procedures. A copy of the project tagging procedures provided to each employee, and training of all employees to reasonably assure their understanding of these procedures.
- Written Orientation Program that includes the following: job hazard analysis, emergency communication procedures, and disciplinary procedures; Project Health and Safety Program requirements; and OSHA requirements. Records of such

training shall be maintained onsite by the contractor and made available upon request for inspection by CDM Federal.

2.0 Surveillance Policy and Procedures

Contractors are responsible for the enforcement of their respective Safety Programs and the Project Health and Safety Program. CDM Federal will provide surveillance of contractors' activities to observe whether such activities are in compliance with the Project Health and Safety Program and contractors' Safety Programs.

2.1 Violation Notification Procedures

In the event of an apparent violation of a safety or health standard, CDM Federal will advise the contractor of the violation and direct that the violation be corrected. If there is a conflict between Project Health and Safety Rules, contractors' Safety Program rules, and governmental regulations, the most restrictive rules shall apply.

Occupational Health and Safety Violation Notice (Written Warning Letter)

The contractor will be informed of identified violations of health and safety standards by means of an Occupational Safety/Health Violation Notice. Violation notices will be delivered by the most expeditious method to the contractor's onsite construction office. The contractor will receive an original plus one copy of each violation notice.

The contractor shall take corrective action within the abatement period shown on the violation notice or propose an alternate solution within the abatement period given. If corrective action is not taken within the abatement period, work shall stop in the respective location, and/or the affected equipment shall not be used until the cited violation is corrected.

When corrective action has been completed, the contractor shall state in writing the corrective action taken, date and sign the original notice, and return it to CDM Federal.

There are four types of violations:

- **Serious** — Any condition or practice which is causing or likely to cause death or serious physical harm to any person.
- **Non-serious** — Any condition or practice which is not likely to cause death or serious physical harm to any person.
- **Stop Work/Imminent Danger** — The existence of any condition or practice, which would reasonably be expected to cause death or serious physical harm before such condition, or practice can be corrected. This is a "stop work" situation. All persons shall be withdrawn from the affected area, and no one shall be allowed in such area except those people deemed necessary to correct the condition or practice.

- **Stop Work Noncompliance** – A violation (serious or non-serious) described in a notice, which has not been totally corrected within the noted abatement time, and the abatement time should not be extended. This is a "stop work" situation. All persons shall be withdrawn from the affected area, and no one shall be allowed in such area except those people deemed necessary to correct the condition or practice.

Imminent Danger Notification

If CDM Federal considers a violation to be imminently dangerous to life, limb, or property, the contractor's representative at that location will be directed to immediately cease work in that area. The imminent danger condition shall be corrected to the satisfaction of CDM Federal before work is allowed to continue.

Repeated Violations

In addition to the above notification procedures, CDM Federal will notify the contractor's corporate office if a particular violation is repeated or the contractor's field supervisor is not cooperative. Such notification to the contractor's corporate office may be either by telephone or in writing; however, telephone notifications will be followed up with written notification.

Repeated nonconformance with the Project Health and Safety Program and repeated failure to comply with correction directives may result in removal of contractor management from the project site or termination of the contract.

2.2 Abatement

In the event that the safety or health hazard noted on the Occupational Safety/Health Violation Notice is not abated within the time period specified and no alternate solution has been proposed by the contractor, CDM Federal will initiate steps to correct the violation and back-charge such expenses to the contractor.

2.3 Notice to Employee of Health and Safety Violation

For contractor employees who knowingly violate the Project Health and Safety Program, a Health and Safety Personal Notice of Violation will be issued. If any one employee should receive three personal notices of violation, disciplinary action will result which may include termination of employment. Employees who knowingly or willfully violate Project Health and Safety Program rules shall be subject to discharge without prior warning.

When a Personal Notice of Violation is issued to an employee, a copy will be forwarded to their employer. Personal Notice of Violation may be issued to contractor supervisor for not enforcing the Project Health and Safety Program rules with the employees under their supervision. Employees terminated for violation of

Project Health and Safety Rules shall not be eligible for rehire for the duration of the project.

3.0 Tagging Equipment Out of Service

The tagging and clearance procedures for placing defective equipment, tools, or cords out of service at the construction project shall be strictly adhered to. In the event that a health and safety hazard is recognized by CDM Federal, the affected equipment will be tagged with a "Danger" tag, immediately taken out of service, and will remain out of service until the defect is corrected.

The contractor representative shall remove the "Danger" tag from the equipment after corrective action has been completed. The contractor shall state in writing on the tag the corrective action taken, date and sign the tag, and return it to CDM Federal. Anyone removing this tag before corrective action has been completed shall be subject to immediate termination of employment.

4.0 Project Health and Safety Program Operation

CDM Federal will distribute to all contractors copies of the Project Health and Safety Manual. The contractors will ensure that all of their employees and subcontractors are familiar with and abide by the contents of this manual, including any changes promulgated and distributed by CDM Federal.

CDM Federal will schedule project safety meetings as needed. The purpose of the meetings will be to discuss health and safety concerns as they relate to all construction projects, provide for two-way communication between the contractor's safety representatives and CDM Federal, and, in general, further the Project Health and Safety Program. All contractors are required to have their safety representative in attendance.

4.1 Accident/Incident Reporting

All injuries, occupational illnesses, accidents, and unsafe conditions are to be investigated by the contractor's safety representative. The safety representative shall complete an Accident/Illness Investigation Report form. The safety representative shall submit the completed report to the CDM Federal Site Health and Safety Officer along with any supportive information such as photographs, witness statements, etc., within two working days after the accident happens. Reports shall be dated and signed by the contractor's safety representative.

In the event of a serious injury, fatality, property damage accident, or any damaging fire, CDM Federal shall be immediately notified regardless of the day or hour. This reporting requirement is in addition to the requirements outlined in the above paragraph.

5.0 OSHA Inspection Procedures

A representative from CDM Federal shall accompany OSHA during inspections of the construction site. Also, as required by OSHA, each contractor will require his employees to select a representative(s) to accompany the OSHA compliance officer during site inspections.

The CDM Federal Site Health and Safety Officer shall examine the compliance officer's credentials prior to the start of any onsite inspection. At all times while onsite, the OSHA representative shall be treated courteously and given full cooperation.

6.0 Fire Protection

Each contractor shall be responsible for fire protection throughout all phases of construction as required by the National Fire Protection Code and OSHA Standard 29 CFR 1926 Subpart F.

Only work procedures which minimize fire hazards to the extent practical shall be used. Fuels, solvents, and other volatile or flammable materials shall be stored in the project's fuel storage area as defined by CDM Federal. Good housekeeping is essential to fire prevention and shall be practiced by all site contractors.

Unless otherwise specified, untreated canvas, paper, plastic, and other flammable flexible materials shall not be used on the project site for any purpose. If such materials are on equipment or materials, which arrive at the project site, they shall be removed and replaced with an acceptable covering before storing or moving into the construction area.

All fires, regardless of size, shall be reported immediately to CDM Federal.

7.0 Safety Policy Memoranda

From time to time, as the need is identified, CDM Federal will issue safety policy memoranda that affect the entire project. Safety policy memoranda will be identified by a number and a specific safety subject, such as Safety Policy Memorandum 1 (Scaffolding). Safety policy memoranda will be issued to all persons who have received a Project Health and Safety Manual. They are to be inserted at the end of this manual.

The person responsible for the receipt and maintenance of the manual shall also be responsible for informing his firm's employees and subcontractors of the contents of the safety policy memoranda.

Safety policy memoranda will have an effective date and an expiration date. Prior to the expiration date, the Site Health and Safety Officer will review the memorandum and either reissue or direct that the memorandum be removed from the manual.

8.0 Housekeeping

Contractors shall, at all times, maintain the premises free from accumulations of waste material, trash, and debris caused by their work. Each work area shall be cleaned and swept each day, if applicable, by the contractor or as often as necessary to remove fire and safety hazards discovered through regularly scheduled inspections. All tools, scaffolding, and materials shall be removed from the work area at the completion of the work. All scrap, waste material, and rubbish shall be removed from the work area daily.

Pre-job planning shall include consideration of housekeeping plans and will include methods and equipment or tools necessary. The contractor's supervisors shall be instructed by the contractor to maintain good housekeeping.

All recommendations for improved housekeeping from CDM Federal shall be acted upon immediately. Refusal or negligence in maintaining good housekeeping can result in the following:

- Back charges to the contractor for removal of trash, rubbish, and waste materials from the work area. Also, back charges for clearing aisles, walkways, and work areas of tools, material, and equipment
- Reports to CDM Federal of inadequate contractor performance
- Suspension of the work until a proper level of housekeeping is achieved

9.0 Ground Fault Protection

Ground fault circuit interrupters shall be used with all power tools and cords. These shall be used regardless of the power source, including portable and wheel mounted generators. The ground fault circuit interrupter shall be tested before each use.

10.0 Crane Inspections

All cranes in use on the project shall be inspected on a monthly basis by a competent person. Inspection results shall be recorded on a Monthly Crane Inspection Report form, which must be submitted to the CDM Federal Site Health and Safety Officer by the fifth working day of each month.

Additionally, the contractor shall submit a current annual crane inspection report to the CDM Federal Site Health and Safety Officer for each crane used on the project. Annual crane inspection reports shall be submitted prior to placing the crane in service. The annual inspection shall be performed by a competent person or by a

government or private agency recognized by the U.S. Department of Labor. The contractor shall maintain a record of the dates and the results of inspections for each hoisting machine and piece of equipment.

Failure to submit the above inspection report will result in a violation notice, which will stop the use of the crane in violation until the required reports are submitted. Whoever knowingly makes any false statement, representation, or certification either a monthly or an annual crane inspection report shall be subject to immediate discharge and will be barred from the project.

The above policy shall in no way eliminate any requirements for crane inspection set forth in the OSHA Standard 1926.550.

11.0 Hazardous Material Program

It is the contractor's sole responsibility to implement and maintain a written Hazard Communication Program as stated in OSHA Standard 29 CFR 1910.1200. Contractors shall submit a copy of their written Hazard Communication Program to the CDM Federal Site Health and Safety Officer prior to beginning work onsite.

Contractors shall submit a Material Safety Data Sheet to the CDM Federal Site Health and Safety Officer for any and all hazardous material they bring onsite or are responsible for. The Material Safety Data Sheet shall be submitted prior to the material arriving onsite.

If a contractor's work with a hazardous material could affect the health and safety of other contractors' employees, the contractor shall coordinate the work with the other contractors to ensure the health and safety of the contractors' employees.

Contractors shall be responsible for the safe storage, use, and disposal of all hazardous material they bring onsite or are responsible for. Contractors shall conspicuously label all containers of hazardous material they are responsible for with their company name.

If the contractor or any of his subcontractors or any of their representatives or employees encounters or has reason to believe contaminated soil or groundwater exists during excavations for project facilities, the contractor shall immediately notify the CDM Federal Site Health and Safety Officer. The CDM Federal Site Health and Safety Officer or his representative shall inspect the work area and determine if work can proceed. If after inspection of the work area, the CDM Federal Site Health and Safety Officer deems there is a hazard to continuing work in the area, the CDM Federal Site Health and Safety Officer will issue a stop work order. Removal of contaminated materials and implementation of the appropriate health and safety plan shall be the responsibility of the contractor, with assistance from local, state, or federal agencies as appropriate.

12.0 Onsite Storage and Dispensing of Flammable and Combustible Liquids

Applicable sections of 29 CM Parts 1926.152 and 1926.153, Health and Safety Regulations for Construction, of the Occupational Health and Safety Act shall be strictly adhered to. The location of out-of-doors storage tanks shall be approved by CDM Federal prior to installation.

13.0 Fall Protection

OSHA Fall Protection Standards 29 CFR 1926 Subpart M shall be strictly adhered to. No person or work operation is exempt from the standard on this project. This includes structural steel erection operations and scaffold erectors. Fall protection is required 100 percent of the time, whether climbing, traveling, or working.

Prior to starting work operations that require fall protection, the contractor shall submit to the CDM Federal Site Health and Safety Officer a Fall Protection Plan. The fall protection plan shall include, but not be limited to, the following:

- Name of the qualified person in charge of the operation
- Description of work operation
- List of fall exposures
- Description of fall protection methods used to eliminate the fall exposures
- Training and enforcement methods used to ensure employee compliance with the plan

13.1 Full Body Harnesses, Lifelines, and Lanyards

Full body harnesses, lanyards, and lifelines shall be used in accordance with OSHA Standard 1926.502 (d), with the following exceptions:

- Full body harnesses shall be used in lieu of safety belts on this project.
- Only lanyards with shock absorbers and locking type snaphooks shall be used.
- At least two lanyards shall be used to provide 100 percent fall protection when moving around obstructions, connection points, or other similar items.

13.2 Safety Nets and Flooring Requirements

Falling hazards to the interior and exterior of buildings shall be governed by the following principles:

- In the structural steel construction of tiered buildings, full body harnesses shall be used in situations in which employees are exposed to falls of six to 25 feet, in accordance with OSHA Standard 1926.28(a).
- In structural steel construction of tiered buildings, safety nets shall be used when employees are exposed to falls of more than 25 feet above the ground or water surface, or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or full body harnesses is impractical, in accordance with OSHA Standard 1926.105(a).
- In the steel construction of tiered buildings, a tightly planked and substantial floor shall be maintained within two stories or 30 feet, whichever is less, below and directly under that portion of each tier of beam on which work is being performed. Where such floors are not practicable, safety nets shall be installed, in accordance with OSHA Standard 1926.750(b)(2)(I).
- In all other types of construction, OSHA Standard 1926.28(a) shall be applicable when employees are exposed to falls of 6 to 25 feet. For fall hazards of more than 25 feet, OSHA Standard 1926.105(a) shall be applicable.

13.3 Guardrail Systems

Guardrail systems and their use shall comply with OSHA Standard 1926.502(b), with the following exception:

- Manila, plastic, or synthetic rope shall not be used as guardrails on this project.

13.4 Training

The contractor shall provide a training program for each employee who might be exposed to fall hazards. The training program shall be taught by a competent person and shall meet the requirements specified in OSHA Standard 1926.503.

14.0 Scaffold Tagging Procedures

The intent of the scaffold tagging procedure is to assure that personnel perform their work from a scaffold that is complete and constructed in accordance with Project Health and Safety Rules and OSHA regulations. If there is a conflict between Project Health and Safety Rules, contractor's Safety Program rules, and governmental regulations, the most restrictive rules shall apply. It is the policy of CDM Federal that all onsite personnel shall comply with this scaffold tagging procedure. Scaffolds not displaying a signed scaffold tag shall not be used.

In addition to the procedures contained in this scaffold tagging procedure, all employees are subject to the OSHA scaffold requirements contained in 29 CFR 1926.451.

Requirements:

- Contractors are responsible to ensure their subcontractors tag their scaffolds in accordance with the project scaffolding tagging policy.
- Scaffold tags shall be provided by the contractor and shall conform to the following color codes.
- All scaffolds shall be marked with one of the following tags:

Green Tag — This scaffold was built to meet federal OSHA scaffold regulations; it is safe to use.

Yellow Tag — This scaffold does not meet federal OSHA scaffold regulations; safety belts shall be worn.

Red Tag — Warning: This scaffold is not complete. DO NOT USE.

- The foreman whose crew constructed the scaffold shall inspect the scaffold for compliance with project and OSHA requirement (1926.451), and shall sign his name to the tag.
- All scaffolds that cannot be equipped with standard top rail, midrail, and toeboard because of interferences with structures or equipment shall be marked with a yellow tag stating that "Body Harness Must Be Used."
- Scaffolds being constructed, torn down or incomplete shall be marked with a red tag.

Responsibilities:

- The foreman who constructs the scaffold or has the scaffold constructed is responsible to ensure that the scaffold is built to project and OSHA standards.
- Contractor personnel shall periodically monitor all scaffolds. The audit shall ensure that all scaffolds are properly tagged and in compliance with project and OSHA standards.
- In the event that a foreman wishes to use another contractor's or crew's scaffold, the foreman shall obtain permission to use the scaffold and shall inspect and tag the scaffold before use.
- Any employee working from a scaffold that does not have a scaffold tag or any supervisor assigning employees to work on an untagged scaffold shall be subject to disciplinary action.

15.0 Confined Space Entry Procedure

Definition of Confined Space: A tank, vessel, silo, vault, pit, open topped space more than 4 feet (1.2 m) deep, pipeline, duct, sewer, or tunnel having limited means of access/egress and/or not designed for continuous employee occupancy and/or having one or more of the following characteristics:

- Less than 19.5 percent oxygen
- Flammable/combustible/explosive atmospheres present or able to be generated or enter into an area
- Toxic atmospheres present or able to be generated or enter into an area
- Areas not protected against entry of water, gas, sand, gravel, ore, grain, coal, radiation, corrosive chemicals, or any other substance which could possibly trap, suffocate, or harm a person
- Poor ventilation
- Restricts entry for rescue purposes

The intent of the Confined Space Entry Procedure is to assure that personnel who perform work in a confined space are in compliance with Project Safety and governmental regulations. If there is a conflict between Project Health and Safety Rules, contractor's Safety Program rules, and governmental regulations, the most restrictive rules shall apply.

It is the policy of CDM Federal that all onsite personnel shall comply with this Confined Space Entry Procedure. All confined spaces shall be authorized for entry by means of a permit. No personnel shall enter a confined space prior to compliance with all permit criteria.

Procedure:

- Confined Space Entry Permit forms can be obtained from the CDM Federal Site Health and Safety Officer. The entry permit shall be a three-part form. Contractors shall fill the permit out in full (except the last line) and post the white and blue copies of the forms in a conspicuous location at the entrance to the confined space. Contractors shall retain the copy a for their records. If there is more than one entrance to the confined space, all entrances shall be posted with a copy of the permit.
- Prior to entry into the confined space, all persons entering the space shall be given a briefing as to the precautions that must be taken.

- When the work in the confined space is completed, the person authorizing entry into the confined space shall verify that all persons have exited the confined space and that it is safe to remove the permit. The authorizing person shall then sign, date, and write in the time the permit was removed.
- Contractors shall retain the blue copy for their records and shall submit the original copy to the CDM Federal Site Health and Safety Officer.

16.0 Trenching and Excavation Notice

Before contractors commence work on any trench or excavation, they shall first submit a completed Trenching and Excavation Notice to the CDM Federal Site Health and Safety Officer. The notice shall be submitted far enough in advance to allow the CDM Federal Site Health and Safety Officer ample time to verify the contractor's submittal. When the CDM Federal Site Health and Safety Officer has verified the information, they shall sign the notice and return a copy of it to the contractor. When the contractor receives the signed notice, he may commence work.

The contractor shall appoint a competent person as defined in OSHA Standard 29 CFR 1926 Subpart P to fill out the permit and monitor all trench and excavation work.

The signature by the CDM Federal Site Health and Safety Officer in no way changes the contractor's responsibility for locating all underground utilities and repair of damaged utilities as required by the contract. The CDM Federal Site Health and Safety Officer shall not be held responsible for the safety requirements for the trench or excavation.

The contractor's competent person shall be responsible for all safety requirements as stated in OSHA Standard 29 CFR 1926 Subpart P.

17.0 Barrier Tape Identification System

In order to identify particular hazards on the construction site uniformly, a barrier tape identification system has been developed for use by all the contractors working on the construction. The identification system has been developed so that any employee working on the site, regardless of employer, can recognize and avoid a hazard when properly marked.

The following barrier tape identification system shall be used:

General Purpose — Multicolor triangular flagging. Used for open manholes, trenches, excavations, etc. "Use caution when crossing."

General — Red tape (may have black in it). "Danger — Do not cross."

Electrical — Yellow (may have black in it). Open wiring, switchgear, etc. "Caution do not cross."

Radiation – Yellow and magenta (purple) tape. Possible radiation hazard, X-ray, etc.
"Do not cross."

The contractor erecting the barrier tape shall hang a tag on the tape that indicates the hazard, name of contractor, and name of person erecting the tape.

The barriers shall be erected far enough back from the hazard to allow for adequate warning and protection from the hazard. The barrier shall be constructed so that it will stand against adverse weather conditions and construction traffic. If the hazard is of a magnitude which requires additional protection, it shall be the contractor's responsibility to provide additional protection as well as the barrier tape. It will be the responsibility of the contractor erecting the barrier tape to maintain it as long as the hazard is present.

18.0 Crane-Suspended Work Platform

The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevated work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions.

The suspended personnel platform design criteria, platform specifications, platform loading, rigging, trial lift, inspection and proof testing, work practices, traveling, and pre-lift meeting shall comply with OSHA Standard 29 CFR 1926.550(g).

19.0 Welding and Cutting

Contractors shall obtain a Hot Work Permit from CDM Federal prior to welding, cutting, grinding, or performing any other "hot work."

The contractor requesting the permit shall address each item listed on the permit and resolve any problems prior to starting the work. CDM Federal shall issue the permit to the contractor upon satisfactory completion of all items.

The contractor shall maintain a copy of the permit in the work area until the work is completed. Upon completion of the work, and once it is determined that no fire hazards exist, the contractor shall return the permit to CDM Federal for filing.

20.0 Lockout/Tagout Clearance Procedures

Whenever service, maintenance, or inspection is performed on machines, equipment, or electrical circuits, it must be done with the machine, equipment, or electrical circuit stopped and isolated from all sources of energy. The energy isolation device(s) for that machine, equipment, or electrical circuits must be locked out and tagged out in accordance with a documented procedure. CDM Federal's lockout/tagout procedure shall be followed when required. Employees involved in the energy control program

must be given training. When contractor employees are performing work within a plant or facility, they must coordinate with CDM Federal and any other employer to ensure that no employees are endangered. When a group of employees is performing a service, maintenance, or inspection activity, each employee must be afforded protection equivalent to the utilization of individual lockout/tagout.

20.1 Control of Hazardous Energy Procedure (Lockout/Tagout)

This procedure establishes the minimum requirements for the lockout/tagout of energy isolating devices whenever maintenance, servicing, or inspection is done on machines, equipment, or electrical circuits. It shall be used to ensure that the machine, equipment, or electrical circuit is stopped, isolated from all potentially hazardous energy sources, and locked out before employees perform any servicing, maintenance, or inspection where the unexpected energization or startup of the machine, equipment, or electrical circuit or release of stored energy could cause injury.

All contractors are required to comply with the restrictions and limitations imposed upon them during the use of lockout/tagout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment, which is locked out to perform servicing, maintenance, or inspection, shall not attempt to start, energize, or use that machine or equipment. Failure to follow the control of hazardous energy procedure will result in disciplinary action.

20.2 Sequence of Lockout

1. Notify all affected employees that servicing, maintenance, or inspection is required on a machine, equipment or electrical circuit and that the machine, equipment, or electrical circuit must be shut down and locked out to perform the servicing, maintenance, or inspection.
2. The authorized employee shall refer to any and all sources to identify the type and magnitude of the energy that the machine, equipment, or electrical circuit utilizes, shall understand the hazards of the energy, and shall know the methods to control energy.
3. If the machine, equipment, or electrical circuit is operating, shut it down by normal stopping procedure (depress stop button, open switch, close valve, etc.).
4. Deactivate the energy isolation device(s) so that the machine, equipment, or electrical circuit is isolated from all energy sources.
5. Lock out the energy isolation device(s) with assigned individual lock(s).

6. Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
7. Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verifying the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.

CAUTION: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

8. The machine, equipment, or electrical circuit is now locked out. The employee(s) that installed the lock shall apply tag(s) identifying who locked the piece out, the date, and the time.

20.3 Restoring Equipment to Service

When the servicing, maintenance, or inspection is complete and the machine, equipment, or electrical circuit is ready to return to normal operating condition, the following steps shall be taken:

1. Check the machine, equipment, or electrical circuit and the immediate area around the machine, equipment, or electrical circuit to ensure that nonessential items have been removed and the machine, equipment, or electrical circuit components are operationally intact.
2. Check the work area to ensure that all employees have been safely positioned or removed from the area.
3. Verify that the controls are in neutral.
4. Remove the lockout/tagout devices and re-energize the machine, equipment, or electrical circuit.

NOTE: The removal of some forms of blocking may require re-energization of the machine before safe removal.

5. Notify affected employees that the servicing, maintenance, or inspection is complete and the machine, equipment or electrical circuit is ready to use.

21.0 Site Security

- Company vehicle shall be the only vehicle brought on the construction site.
- Employees and subcontractors employees will be provided designated parking.

- Employees are subject to search at any time while leaving the construction site.
- An entrance will be available for all subcontractor and employees to use.
- A security fence will be place around the construction site for security reasons.
- CDM Federal is not liable for lost or stolen material and equipment.
- The use of illegal drug or alcohol is prohibited on all CDM Federal projects.

22.0 Monthly Reporting

Each month, each subcontractor is required to submit a Monthly Man-hour Summary Report to the CDM Federal project manager. In turn, the Project Manager will report the Summary Report to the CDM Federal Corporate Health & Safety Director. This report contains statistical data on all first aid cases, recordable incidents, and lost time accidents. The report in general will provide frequency rates and incident rate as well as severity.

Appendix D

CDM Federal Health and Safety Audit Criteria

The purpose of the health and safety audit is to provide CDM Federal and subcontractors "leading indicators" to verify field compliance with health and safety practices and procedures and feed this information back to improve field practices on all construction projects.

1.0 Methodology

Field auditors will audit general practices and procedures using these specific criteria.

- Whenever possible, auditors shall be accompanied by CDM Federal health and safety personnel assigned to the specific area being audited.
- Feedback will be given to health and safety field personnel in a timely fashion. (If a serious problem is noted, the information will be relayed to a Health and Safety Coordinator immediately).
- Whenever possible, audits will note the subcontractor performing the work.
- Observations sheets will be scored and data accumulated for a particular general practice or procedure.
- Results of the audits will be fed back to the appropriate personnel or subcontractor in order to achieve timely and consistent improvement in a general practice or procedure.

2.0 Audit Criteria

Specific criteria for each of the general practices/procedures to be audited can be found on the attached sheets. These specific criteria outline areas which field auditors should be focusing on in the field and are the basis for determining if an observation is in or out of compliance.

- Fall Protection
- Personal Protective Equipment
- Ladder and Lift Use
- Hazardous Materials
- Confined Space
- Lockout/Tagout and Electrical Hot Work

- Electrical (grounding, etc.)/Fire Protection and Hot Work
- Scaffolding

3.0 Fall Protection Audit Criteria

- A "fall protection system" is used whenever work is being performed at a height above 6 feet. The feet of a worker comprise the point of measurement for the 6-foot rule.
- Fall protection may be accomplished by use of the following systems:
 - Ladders, lift units, and scaffolding qualify as fall protection as long as the body of the worker remains in the plane of the equipment/structure and the equipment/structure is properly set up and secured.
 - Guardrails, static lines, anchor points, nets, and vertical lines must be properly located, constructed and anchored. Documentation is required for static line installations.
 - Personal protective equipment including lanyards and full body harnesses is approved and in good condition.
- Positive fall protection is effectively utilized to ensure that no more than six feet of free-fall can occur. An example of where more than six feet of free fall can occur is when a worker "walks out" their retractable over six feet.

Exception: When working within the plane of a properly installed ladder, fall protection is not required.

- Work practices:
 - Lanyards are not looped
 - Ends of rebar are capped where implement can not occur (below five feet)

4.0 Ladder and Lift Audit Criteria

Ladders:

- Commercial grade ladders only, with exception of wood gang ladders.
- Structural defects are repaired immediately or "DO NOT USE" label attached conspicuously.
- Secured against accidental movement by:

- Access ladders tied off
 - Set on a stable base
 - Set at safe climbing angle: 4:1 ratio or 70 degrees
 - Worker retains three points of contact with ladder
 - Tools and equipment are not carried while climbing
 - Body remains in plane of ladder
 - Top two rungs not used
- Gang ladders shall not be used to access areas higher than 20 feet.

Forklifts:

- Platforms are approved and secured to unit
- Operator remains at controls

Manbaskets and Cranes:

- Critical Lift Plan has been filed with CDM Federal
- Annual crane inspection available
- Daily maintenance logs

Aerial Lifts:

- Personnel are trained and authorized
- Equipment is in good operating condition (no leaks, operations is smooth)
- Travel is in lowered position when possible or overhead obstructions are taken into account
- Load is under maximum rating
- Guardrails and toeboards in place and used; gate secured
- Platform height not extended through use of ladders, platforms, planks or other devices
- Full body harness and lanyard used (boom-extended lifts only)

- Fueling performed with engine off
- Battery recharge occurs in clean, well ventilated, flame free area
- Housekeeping on platforms adequate to prevent slips and falls and material falling on workers below

5.0 Personal Protective Equipment Audit Criteria

Eye Protection:

- Safety glasses or goggles meeting the ANSI Z87.1 standard must be worn in all construction zones.
- Sideshields shall be fixed and meet ANSI Z87.1 requirements.
- High eye injury potential work (welding, grinding, cutting brick or steel, etc.) requires additional eye and face protection such as a face shield or welders goggles.

Foot Protection:

- Work boots must meet the ANSI Z41.1 requirement.
- Leather boots reaching above the ankles are required in construction zones.
- Rubber boots are acceptable for concrete work only.

Head Protection:

- Approved hard hats are required in the construction zone.(ANSI Z89.1)
- Hard-hats may not be worn backwards.

Hand Protection:

- Heavy gloves are worn when handling materials that present a cut hazard.

6.0 Hazardous Materials Audit Criteria

Storage:

- Materials are stored in approved areas and within secondary containment. (Exceptions are granted for pending use materials of low environmental toxicity (latex paint) upon the discretion of the CDM Federal Site Health and Safety Officer.)
- Incompatible materials are separated.

- Leaks and drips are not apparent.
- A responsible individual is identified on signage in each major area.

Use:

- Workers are using appropriate personal protection equipment.
- Engineering controls (ventilation) or administrative controls are implemented where necessary.
- Lids and caps are secured on containers when not in immediate use.
- Leaks and drips are not apparent.

Training, Labeling and Material Safety Data Sheets (MSDSs):

- All containers are clearly labeled for contents and hazards.
- MSDSs are on site or at the subcontractor's office area.
- Workers have attended the CDM Federal Hazcom/Environmental training class.
- "No Smoking" signs are posted and observed around flammable and combustible materials.

7.0 Confined Space Audit Criteria

- Confined spaces, including manholes, tanks, rooms under construction, excavations, etc., have been evaluated and classified as permit or non-permit required.
- A confined space entry plan form has been completed and is current.
- When chemicals are planned for use as part of the entry, the CDM Federal project Project Manager has approved and signed approval.
- Lockout/tagout procedures are used where required and a double valve system is used to protect workers in the confined space.
- Confined spaces are signed as such indicating "Danger" and "Entry by Permission Only."

8.0 Lockout/Tagout & Electrical Hot Work Audit Criteria

- Any system posing a risk of a hazardous energy (electrical, hydraulic, chemical, pneumatic, mechanical, etc.) shall be locked out and tagged prior to maintenance, servicing, adjusting, cleaning or additional construction.

- A CDM Federal Lock-Out/Tagout Plan has been completed and is current for work being performed.
- Subcontractors are following a lockout/tagout procedure that is written and compliant and at least as stringent as CDM Federal's plan.
- Locks and tags remain on the lockout device until the job is completely finished and all potential of the release hazardous energy is removed.
- One lock and tag per worker working on the job is installed on the lockout device. Each lock is under the exclusive control of a worker and tags are identified with the worker's name and date of work.

9.0 Electrical/Fire Protection & Hot Work Audit Criteria

Electrical:

- Maintenance of electrical equipment shall be achieved in one of two of the following ways:
 - 1) Through the use of an Assured Equipment Grounding Program. Tested equipment shall be color coded as follows:

White	January through March
Green	April through June
Red	July through September
Orange	October through December
 - 2) Through the use of Ground Fault Circuit Interrupters (GFCIs).
 - Defective equipment shall be tagged and removed from service.
 - Only construction grade extension cords are used.
 - Cords are strung overhead.

Fire Protection & Hot Work:

- Fire extinguishers are provided throughout the area and locally in specific hot work areas.
- A current hot work permit has been issued and posted.
- A fire watch is being performed if so required by the permit.

- Combustible and flammable materials do not provide fuel to a potential fire.
- Welding shields are in place.

10.0 Scaffolding Audit Criteria

- A Scaffold Plan has been filled out for any scaffolding exceeding 20 feet and a CDM Federal health and safety staff person prior to use shall approve all scaffolding.
- Scaffolding is constructed on firm and level ground.
 - Adequate sills and base plates are provided.
- Scaffold use is greater than 10 feet from power lines.
 - The CDM Federal Project Manager for the area has approved use by multiple contractors and each contractor inspects scaffold prior to use.
- A competent person performs daily inspections on scaffolds.
 - Damaged equipment is tagged and put out of use.
- Access ladders should not exceed 20 feet without a break.
- Cross braces shall not be used for climbing.
- Suspension scaffolds require an independent safety line for each employee who shall wear a full body harness.
- Planks, guardrails, and toeboards are installed in compliance with OSHA requirements and in good condition.
- Loads do not exceed ratings (light use 25 lb/sq. ft.; medium 50 lb/sq. ft. and heavy 75 lb/sq. ft.).
- Scaffolds are braced at appropriate ratios (4:1 for metal, 3:1 for aluminum).
- Tower scaffolds will not exceed four times the smallest base dimension.
- Scaffolding will be secured to structures every 30 feet horizontally and every 26 feet vertically.
- Personnel shall not ride rolling scaffolds.